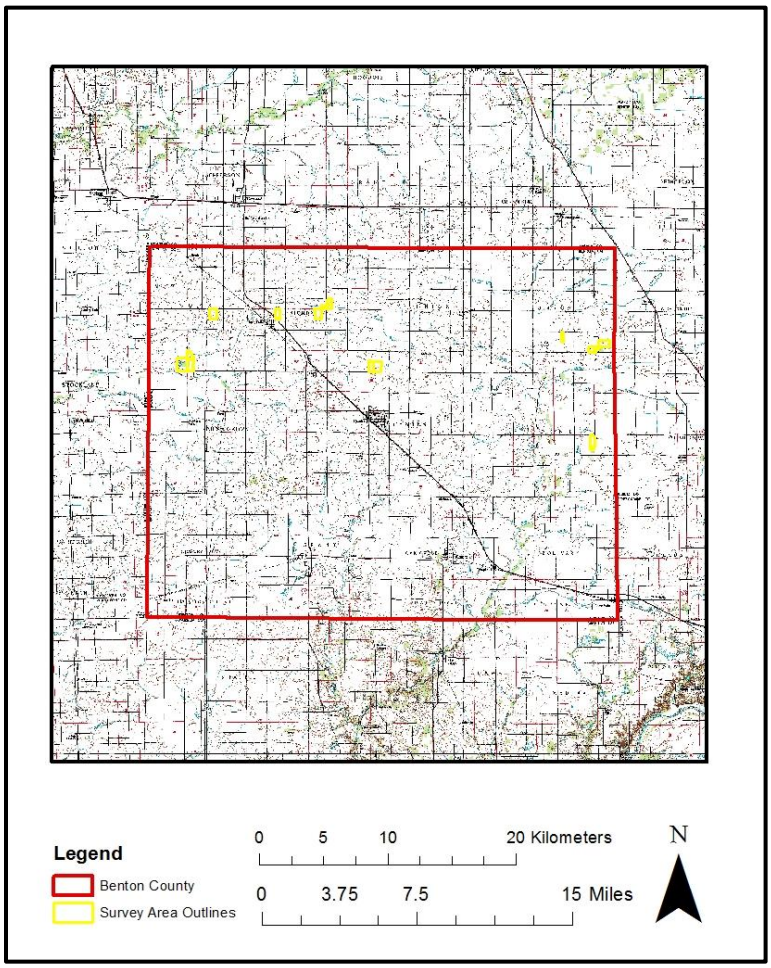
An Archaeological Survey of Benton County: Enhancement of a Data Deficient Region

Grant # 18-15FFY-03



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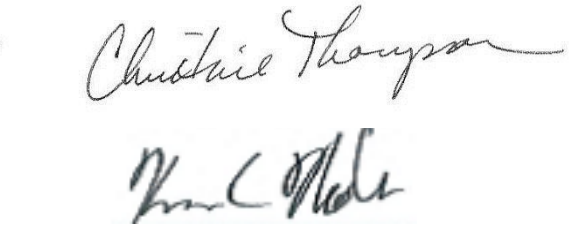

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The field work and laboratory processing was completed by AAL Senior Archaeologist Kevin C. Nolan, AAL Archaeologist Christine Thompson, AAL Administrative Assistant and Archaeologist Amber Yuellig, myself, and the following Ball State students: Silas Chapman, Abby Clark, Henry Easley, Justin Fleetwood-Goolsby, Nora Hillard, Jamie Leeuwrik, Bryan Mitchell, Kiya Mullins, Charity Munro, Savannah Myers, Mia Nickleson, Eyn Philips, Ryan Shank, and Rachel Watts.

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Amanda Balough

Abstract

The Applied Anthropology Laboratories (AAL) at Ball State University conducted a data enhancement project for archaeological resources in Benton County, Indiana for a FY2015 Historic Preservation Fund Grant (Grant #18-15FFY-03). This Historic Preservation Fund grant project investigated the archaeological resources of Benton County, Indiana with a focus on the northern half of the county. Approximately 841.29 acres (340.46 hectares) of agricultural land were surveyed and 85 new archaeological sites were recorded. The survey recovered 81 prehistoric artifacts and 442 historic artifacts from twelve parcels of land within Benton County. No human remains were discovered as a result of this grant project. Cultural periods that are represented in the artifact assemblage include precontact components dating to the Late Archaic, Middle Woodland, and possibly the Early Archaic, in addition to 54 Historic components. The average site density recorded for the project area for precontact sites was one site per 20.03 acres and for historic sites was one site per 15.58 acres.

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Introduction

The Applied Anthropology Laboratories (AAL) at Ball State University was awarded a FY2015 Historic Preservation Fund Grant to survey portions of Benton County, Indiana. The project involved a pedestrian survey of approximately 841.29 acres of agricultural land. The main goals of the project were to increase the site data base, refine the cultural chronology for the county, examine evidence for the early Euro-American settlement, resolve any inconsistencies found in the State Historic Architecture and Archaeological Research Database (SHAARD), and provide updated information for collector reported sites in SHAARD. Specifically we hope to add to the understanding of the various prehistoric cultural periods of the county based on the low number of previously documented sites compared to the surrounding counties. We also hope to add to the understanding of the Euro-American presence and Native American interaction in Benton County. Benton County had 96 archaeological sites recorded in the State Historic Architecture and Archaeological Research Database (Division of Historic Preservation and Archaeology 2015) database prior to this survey. This investigation focused on the northern portion of Benton County.

The following research questions, while not exhaustive, guided this project.

1. What is the cultural chronology for Benton County?

2. What are the densities and distributions of archaeological sites in northern Benton County?

3. What is the settlement pattern for Euro-American people in northern Benton County?

4. What is the average site density within the county?

5. Is prehistoric occupation more extensive and/or more intensive at the ecotones between the environmental zones?

Background

Environmental Setting

To provide a framework for interpreting the data collected during this project, a review of the natural and cultural setting was undertaken. The background information presented in this report includes environmental and archaeological information concerning Benton County, Indiana.

Location

The project area is located in Benton County (Figure 1), which has an area of 260,237 acres (105,314.18 hectares) (Barnes 1989:1). For the proposed research, we targeted areas around the Iroquois River watershed within the Till Plain region in the northern half of the county (Figure 2 and Figure 3).

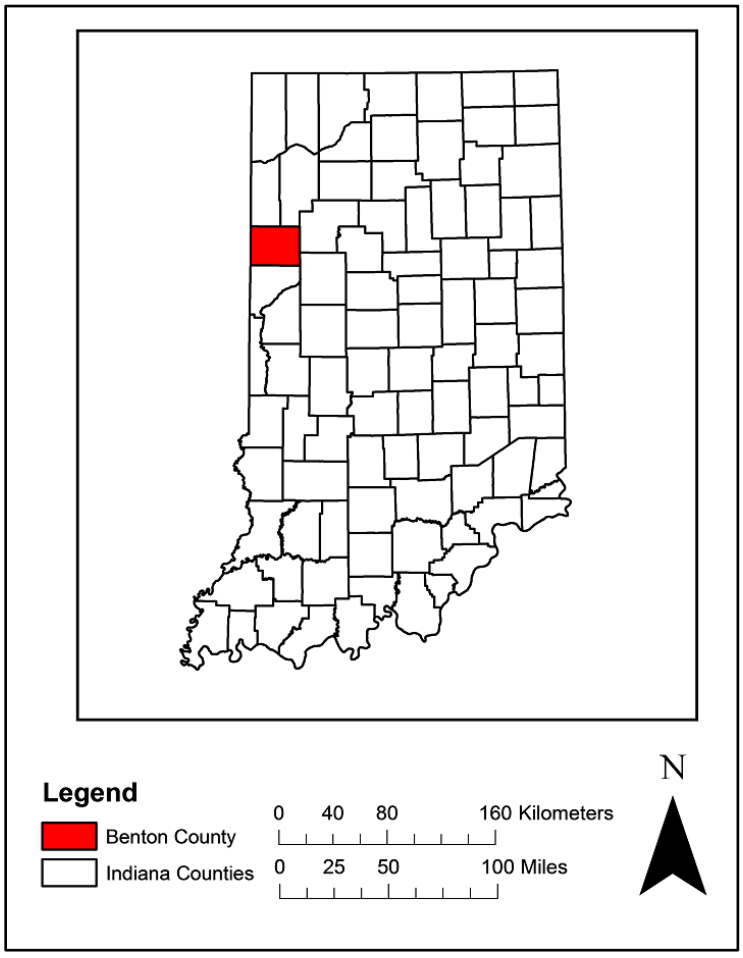

Figure 1: Benton County within the state of Indiana (based on Yellowmap World Atlas 2015).

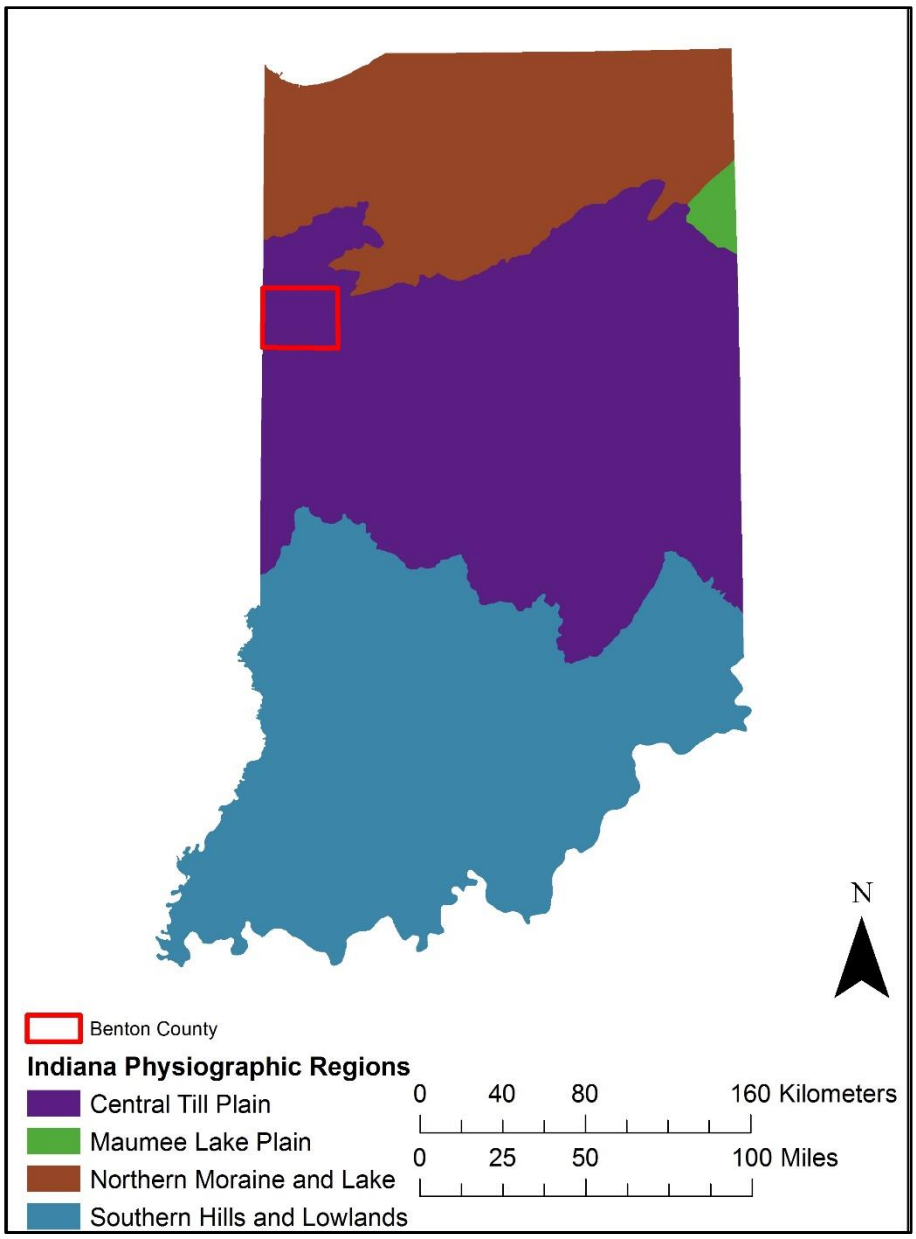

Figure 2: Benton County within the Central Till Plain (based on Gray and Sowder 2002).

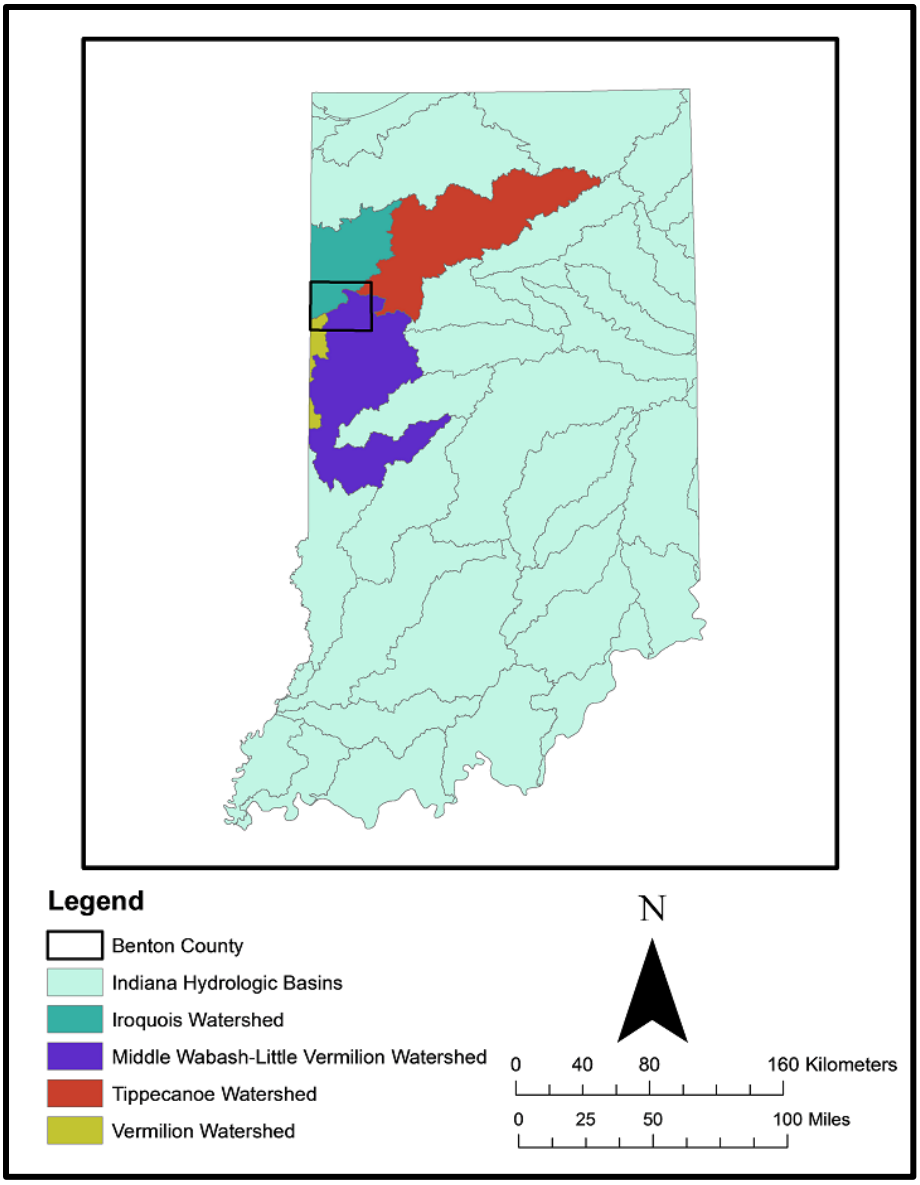

Figure 3: Benton County within the Iroquois River, Middle Wabash-Little Vermillion River, and Tippecanoe River Watersheds (Indiana Department of Natural Resources 1975).

Geology

The structural framework of Indiana is divided into three general areas: the Illinois and the Michigan Basins which are separated by the Cincinnati Arch and its branches of the Findlay and Kankakee Arches (Gutshick 1966:9). Benton County is located within the Tipton Till Plain, a nearly flat to gently rolling glacial till plain (Schneider 1966:41).

The Tipton Till Plain can then be divided into smaller bedrock physiographic units. The project area is within one of those units known as the Rensselaer Plateau (Schneider 1966:54).

The Rensselaer Plateau occupies more than three quarters of Benton County. This bedrock unit is described as being physiographically distinct from other physiographic belts that are found in more southern regions of Indiana (Schneider 1966:55). Attica chert, Liston Creek chert and Kenneth chert are the documented bedrock cherts in the region around Benton County (Figure 4).

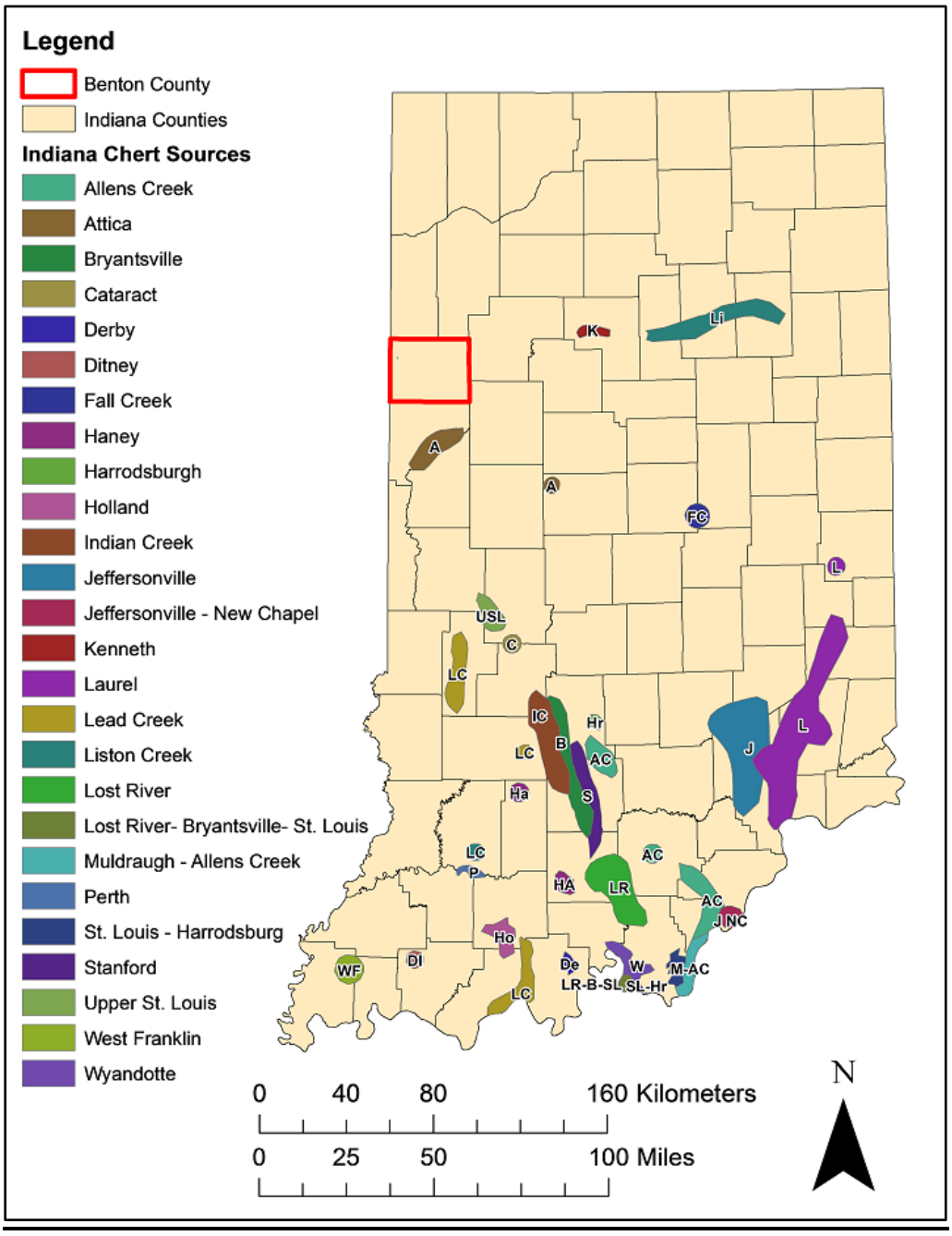

Figure 4: Chert Outcrop Locations in Indiana (digitized by Brad Painter from Cantin 2008).

Stratigraphically, Attica chert (Figure 5) is a member of the Muldraugh Formation of the Borden Group of the Mississippian Period (Cantin 2008:15). Also known as "Wabash Green" and "Independence", Attica chert is described as being blue-green in color with blue-grey streaks, bands and mottles (Cantin 2008:11-12). When heat treated, Attica chert takes on a purple color with pinkish bands and streaks (Cantin 2008:12). Texture is variable, ranging from fine-medium to medium coarse; luster is generally usually dull to slightly glossy (Cantin 2008:12). Fossil inclusions are rare with the exception of microscopic sponge spicules; however crystalline vugs have been encountered (Cantin 2008:12). Temporally, Attica chert is found in all cultural periods in Indiana however little use is documented for Woodland and Mississippian periods in Indiana (Cantin 2008:13).

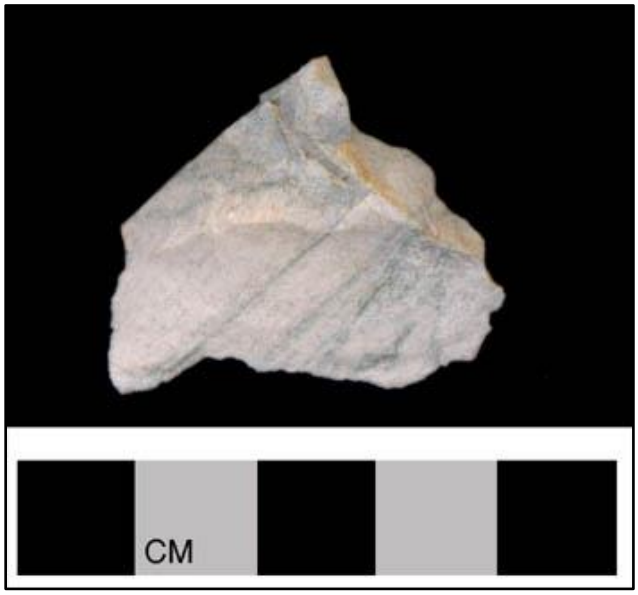

Figure 5: Example of Attica Chert from the Center for Social Research Chert Collection (Stelle and Duggan 2003).

Liston Creek chert (Figure 6) is both a nodular and bedded chert found in Liston Creek limestone which is a member of the Wabash Formation, Niagara Series, of the Silurian System (Cantin 2008:54). Liston Creek chert is always grey in color, but the shade of grey varies from very light to medium grey. As it weathers, Liston Creek chert can develop tan or brown patches. All these variations in color can occur within one sample. Textures of Liston Creek chert can be coarse to medium fine. Small calcitic or siliceous speckles are found within this chert type. These specks are most likely small fossils; however, the spots are too small to be determined as such. Liston Creek Chert was used heavily by prehistoric groups (Cantin 2008:55).

Figure 6: Example of Liston Creek Chert from the Ball State University AAL Chert Collection (photo by Ball State University).

Kenneth chert (Figure 7) is a bedded chert found in Kenneth limestone which is a member of the Salina Formation of the Silurian System (Cantin 2008:46). Kenneth chert is known to be white to light grey in color, with light to dark grey and, or brownish-grey patches. These color variations can all be present within one sample. When weathered, Kenneth chert's appearance and texture become chalky white. Fossils are found within Kenneth chert, however the fossils are mostly "siliceous blobs" (Cantin 2008:47). Information on the usage of Kenneth chert is limited. Cantin (2008:48) notes that Kenneth chert should be archaeologically found throughout the Tipton Till Plain region.

Figure 7: Example of Kenneth Chert from the Center for Social Research Chert Collection (Stelle and Duggan 2003).

The close proximity of Benton County to Illinois chert sources (Figure 8) has led to several types of Illinois chert being encountered during this survey. The closest Illinois chert outcrops are Harmilda and Elwood-Joliet located in DuPage and Will Counties respectively. Closely related to Elwood-Joliet chert are Blanding and Burlington cherts, which overlap in several classificatory properties along with Glacial Till chert (Stelle and Duggan 2003). The Blanding chert outcrop is located in Jo Davies County and Burlington chert outcrop is in Jackson County.

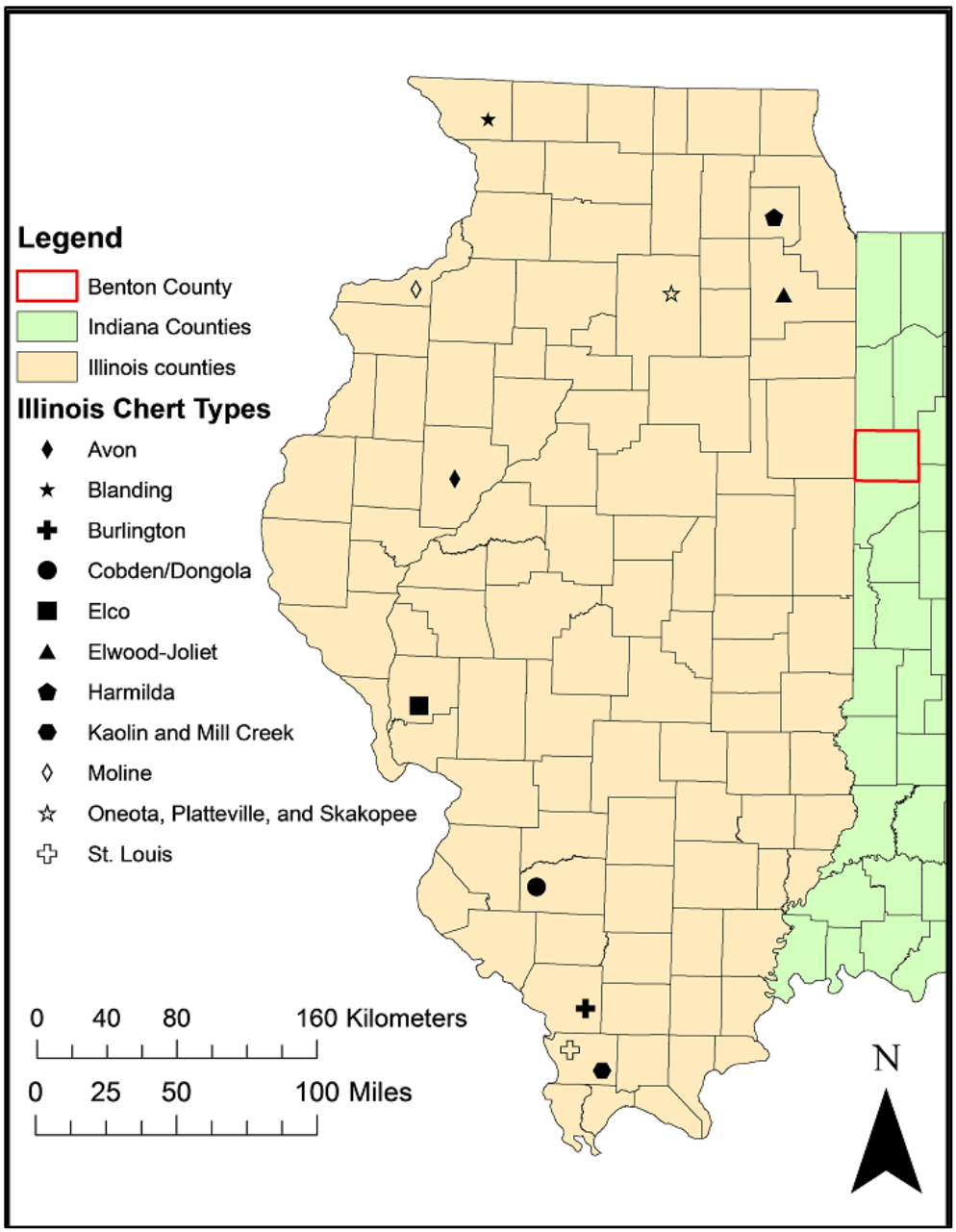

Figure 8: Chert outcrop locations in Illinois (DeRegnaucourt and Geogiady 1998).

Blanding chert (Figure 9) is a medium to medium fine texture Mississippian Period chert that is dull in luster and naturally occurs in northwestern Illinois. Blanding chert can range from white to gray in color with pale yellowish, brown, or orangish streaks and faint banding (Stelle and Duggan 2003). Heat treatment of Blanding chert can cause the color to move to pink tones and the luster becomes more satin-like. Fossil fragments of sponge spicules, corals, and crinoid columnals are found frequently in the contrasting colors (Stelle and Duggan 2003).

Figure 9: Example of Blanding Chert from the Center for Social Research Chert Collection (Stelle and Duggan 2003).

Burlington chert (Figure 10) is a bedded Mississippian Period chert derived from the Burlington Limestone Formation occurring in the west-central region of southern Illinois (Koldehoff 1985:12). Burlington chert commonly has a base color of white to gray to tan with a waxy luster and can occasionally be mottled or banded (Stelle and Duggan 2003). Heat treatment of Burlington chert is frequently encountered and changes the base to a pure white or very light pink color. Fossil present in Burlington chert can include sponge spicules, brachiopods, bryozoans, corals, and crinoid columnals (Stelle and Duggan 2003). Due to the medium to fine texture and the enhanced flaking properties from heat treatment, Burlington chert was often selected for biface production (Koldehoff 1985:12; Stelle and Duggan 2003).

Figure 10: Example of Burlington Chert from the Center for Social Research Chert Collection (Stelle and Duggan 2003).

Elwood-Joliet chert (Figure 11) is a medium texture Mississippian Period chert that is dull in luster and is naturally occurring in northeastern Illinois. Elwood-Joliet chert white to gray in color and contains small iron pyrite structural inclusions (Stelle and Duggan 2003). Fossil inclusions present are sponge spicules, brachiopods, bryozoans, and crinoid columnals. Other inclusions present in Ellwood-Joliet chert are druse and limestone, which can make the chert appear sugary under magnification (Stelle and Duggan 2003). Heat treatment effects on color and luster of Elwood-Joliet chert is unknown.

Figure 11: Example of Elwood-Joliet Chert from the Center for Social Research Chert Collection (Stelle and Duggan 2003).

Harmilda chert (Figure 12) is a Silurian chert that is a member of the Silurian System occurring in DuPage County, Illinois. The luster of Harmilda chert ranges from dull to waxy corresponding to the variable texture with semi-translucent regions being fine to medium grained and waxy, while the opaque regions are medium to course grained and dull (Stelle and Duggan 2003). Few fossils are present in Harmilda chert, sponge spicule inclusions can be found in the semi-translucent regions and crinoid casts can be found in the opaque regions. Heat treatment causes Harmilda chert to turn a red or reddish brown color and the luster is enhanced weakly (Stelle and Duggan 2003). Harmilda chert tends to overlap visually with Kenneth and other Silurian aged cherts from Indiana.

Figure 12: Example of Harmilda Chert from the Center for Social Research Chert Collection (Stelle and Duggan 2003).

Glacial History

Modern Indiana has been shaped by the cumulative effects of three glaciations: the Kansan, Illinoian, and the Wisconsin glacial episodes (Shurig 1970:6). The glaciers were formed in the upland east area near the Hudson Bay and spread out across the North American continent, reaching its farthest in the Wabash and Ohio Valleys – south of the 38th parallel – farther than anywhere else in the Northern Hemisphere during the Pleistocene Epoch (Wayne 1966:21). Each new glacial migration brought with it tons of glacial drift that resurfaced the face of Indiana. The current homogenous appearance of Indiana's central region is misleading because

underneath the surface lies a blending of bedrock and glacial drift that indicates its volatile glacial past.

The Kansan Age glaciation was the first to impact Indiana and dates from approximately 350,000 to 400,000 years ago (Melhorn 1997:18). It extended southward towards the Scottsburg Lowland. The glaciation was responsible for the formation of the Ohio River. The pre-glacial Teays River valley was the main drainage system across the country stretching from North Carolina to Illinois. The waterway was dammed in western Ohio by the encroaching glacier and forced to find alternative outlets. The drainage was diverted to what is now the Ohio River (Shurig 1970:6). The Kansan glaciation was also responsible for some of the deepest valley-cutting during the Ice Age and deposited roughly 75 to 100 feet of glacial drift (Wayne 1966:32).

Glaciations are followed by years of warming, which result in differences in fossils and soil deposits. These differences make it possible to clearly delineate various glacial episodes. The Yarmouth Age was the warming period that followed the Kansan Age and lasted for 200,000 years (Melhorn 1997:18); it was later followed by the second glacial episode, the Illinoian Age.

The Illinoian Age began 125,000 years ago (Wayne 1966:32). This is the glaciation that was responsible for delving the farthest into the Northern Hemisphere. The glacier margin fluctuated three times from its origin in the Lake Michigan Lowland to just south of the 38th parallel (Wayne 1966:33). Each fluctuation resulted in distinct till coloration as well as types of fossils present. The warming period known as the Sanagamonian Age succeeded this glaciation and then gave way to the next major ice age known as the Wisconsin Age (Wayne 1966:34).

The most recent glaciation, the Wisconsin Age, began its encroachment upon Indiana from the northeast 70,000 years ago and produced the Trafalgar Formation (Wayne 1966:34). The glacier was approximately 1,700 feet thick in certain areas (Wayne 1966:27). Most of Benton County is part of the Cartersburg Till Member (Figure 13), which is part of the Trafalgar Formation (Wayne 1966:26). The Trafalgar formation is primarily composed of massive calcareous conglomeritic mudstones (a compact but uncemented sandy, silty, matrix) with scattered beds of gravel, sand and silt (Wayne 1963:45).

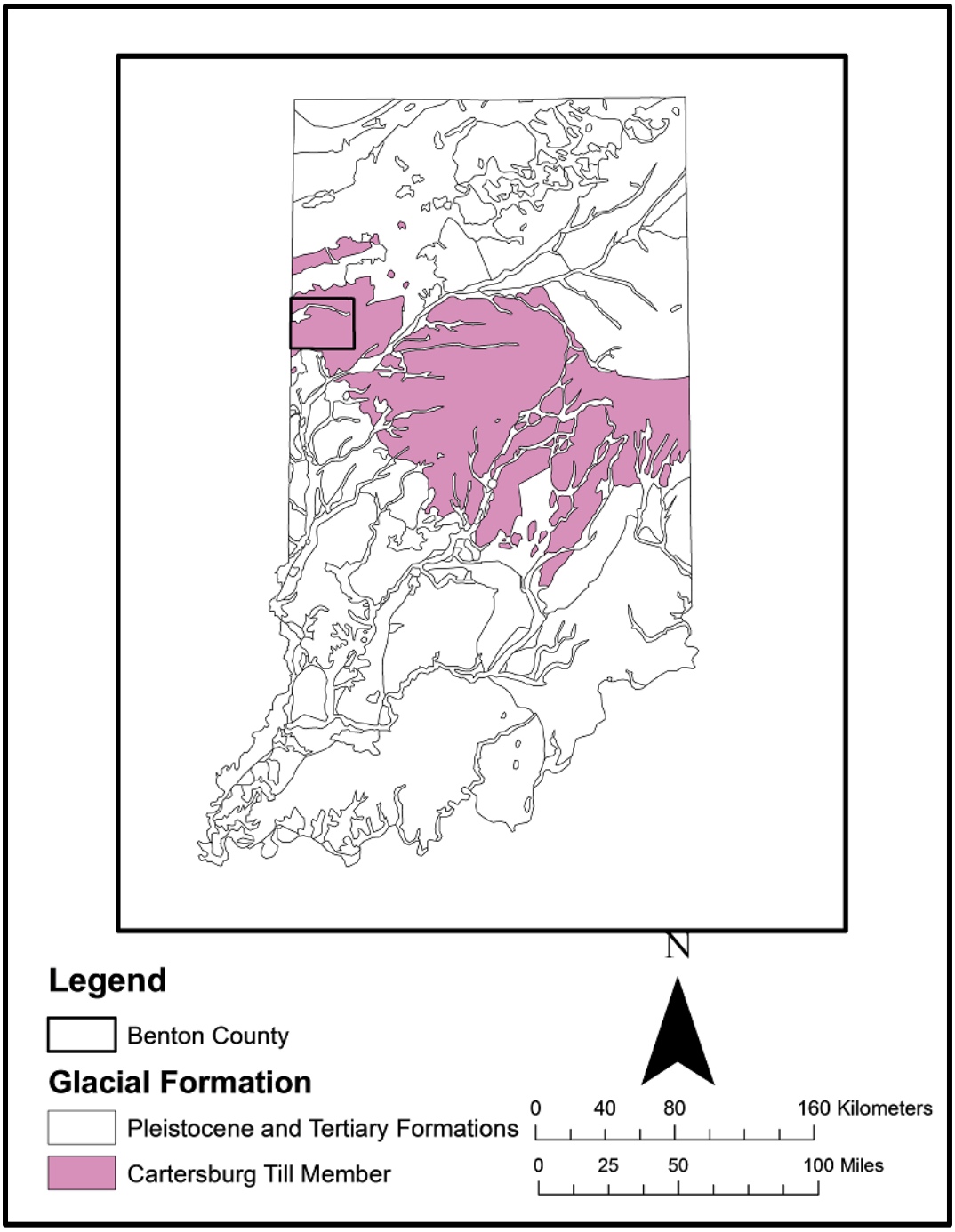

Figure 13: Location of Benton County and the Cartersburg Till Member (based on Wayne 1966:26).

Unconsolidated sediments overlie the Trafalgar Formation in some areas and were deposited extraglacially as the Atherton Formation (Wayne 1963:31, 1966:26). These sediments of gravel, sand, silt and clay were derived primarily from glacial outwash and were sorted and deposited by meltwater currents, wind action or in the quiet waters of glacial lakes (Wayne

1963:31, 1966:26). All of Benton County is comprised of the Catersburg Till Member, which consists of stratified course-grained sediments deposited by glacial meltwater, with a small portion of northern Benton consisting of Pleistocene and Tertiary Formations (Wayne 1963:32; see Figure 13). The Cartersburg Till Member belongs to the Trafalgar Formation which was deposited during the Wisconsin Age (Wayne 1963: 28). During the Wisconsin Age, two main ice advances, which covered about two-thirds of Indiana 21,000 years ago, deposited groups of tills, consisting of outwash sand and gravel, which resulted in the Trafalgar Formation. After the active ice margin had melted, the entire lobe in central Indiana ceased to move; the outwash plains, kames, and moraines are evidence of an active glacier, but the esker(s) troughs are evidence of stagnant ice (Wayne 1963:36).

Physiography

Benton County is within the general physiographic unit known as the Tipton Till Plain (Gray and Sowder 2002; Schneider 1966) places the county within the Iroquois Till Plains (Figure 14). The Tipton Till Plain is an area of low relief with extensive areas of ice-disintegration features; it covers all of Benton County (Schneider 1966:41).

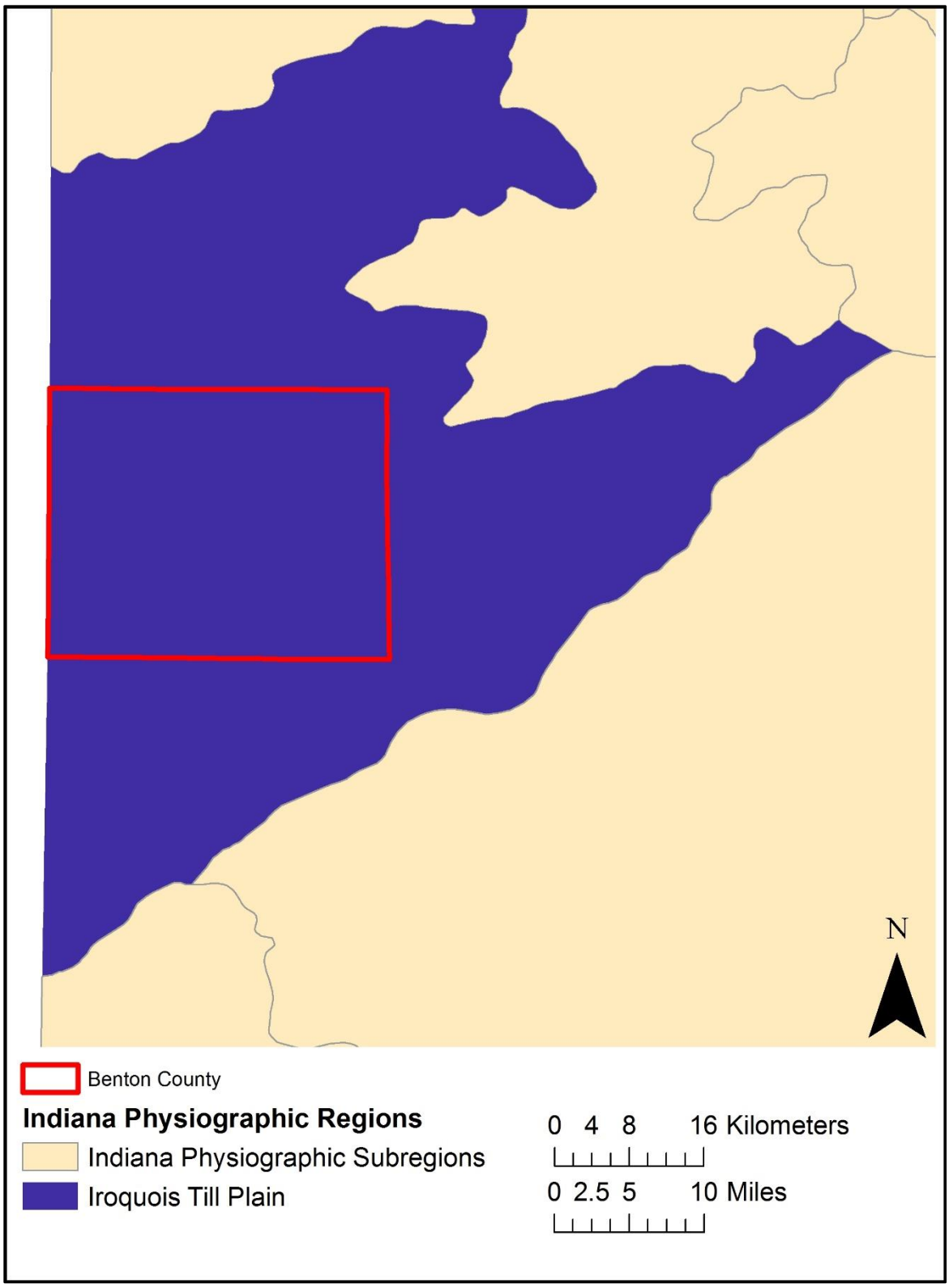

Figure 14: Physiographic divisions and survey areas in Benton County

Soils

The majority of soils found in Benton County are made up of mainly nearly level and gently sloping ground moraines. Scattered areas of more strongly sloping end moraines are throughout the county. The county has a few areas of organic soils, but these areas are generally small (Barnes 1989:1).

There are ten soil associations mapped within Benton County (Table 1). Soil associations with landforms of floodplains and till plains (Montemorenci-Miami-Chalmers and Bryce-Swygert, consistent with Miami-Miamian-Xenia, Drummer-Toronto-Wingate, Gilford-Maumee-Sparta, and Sawmill-Lawson-Genesee in STATSGO) (USDA/NRCS 2002) represent a small percentage of the county. Soil associations with landforms of outwash plains (Chalmers-Lisbon-Drummer and Drummer-Comfrey-Tippecanoe, consistent with Drummer-Toronto-Wingate, Saybrook-Drummer-Parr, Warsaw-Lorenzo-Dakota, Barce-Montimorenci-Drummer, Gilford-Maumee-Sparta, Wolcott-Odell-Corwin, and Morley-Markham-Ashkumin in STATSGO) also account for a small percentage of Benton County. Soil associations that form glacial till (Corwin-Odell-Chalmers and Montmorenci-Miami-Chalmers consistent with Gilford-Maumee-Sparta and Miamia-Miamian-Xeniain in STATSGO) account for the second largest percentage in Benton County. The largest percentage of soil associations in Benton County form moraine landforms (Gilboa-Chalmers,Elliot-Ashkum-Selma, and Corwin-Odell-Chalmers consistent with Saybrook-Drummer-Parr, Wolcott-Odell-Corwin, and Barce-Montmorenic-Drummerin in STATSGO) (Barnes1989:9-16). In 2002 the USDA updated revised their soil associations when producing STATSGO (USDA/NRCS 2002). Those soil associations are shown in Figure 15.

At a finer scale there are 38 soil series present in Benton County. The vast majority of the county is characterized by poor or somewhat poor drainage soils. Silt loam textures are predominant, followed by silty clay loam then clay loam soils. Overall, the textures tend towards the finer grain sizes. The soils are classified into seven soil groups according to soil taxonomy: Argiudolls, Endoaquolls, Haplosaprists, Endoaqualfs, Hapludalfs, Humaquepts, and Udipsamments (Figure 16). These can generally be associated with primary soil forming factors consistent with prairies (i.e., mollisols), wet prairies (aquic mollisols), high organic content (histisols), wet forest soils (aquic alfisols), forest soils (alfisols), wet accumulating/young landforms (aquic inceptisols), and young/accumulating dune formations (entisols), respectively. The vast majority of the county is characterized by mollisols (prairie soils) with wet prairie constituting a slightly larger proportion. The juxtaposition over short distances between soil forming factors associated with dry versus wet prairies creates very fine scale mixes of different ecological resources. This mix is supplemented by the forest soils (alfisols) sprinkled in clusters and linear concentration across the northern and eastern portions of the county. Dry forests predominate with wet forests focused primarily in the eastern third of the county. While not a perfect proxy for pre-contact environments, these soil classification should capture variability in

the dominant soil forming factors (climate, biota, topography, and parent material) for the last several centuries to millennia (Figure 16).

Table 1: Benton Soil Associations (Barnes 1989).

Association	Description	Landforms	% of County
Barce-Montemorenci-Drummer	Very deep, moderately well drained soils consisting of loams and silty material, nearly level or gently sloping, formed in loamy outwash; on ground moraines and end moraines.	Ground and end moraines	8%
Drummer-Toronto-Wingate	Silty soils that are nearly level and gently sloping, are poorly drained, very poorly drained, and moderately well drained, and formed in silty deposits and outwash and in alluvium and outwash; on flood plains, outwash terraces, and outwash plains.	Floodplains, outwash terraces, and outwash plains	13%
Gilford-Maumee-Sparta	Deep, nearly level to strongly sloping, well-drained and excessively drained, moderately coarse textured soils on till plains, moraines, outwash plains, and terraces	Till plains, moraines, outwash plains, and terraces	2%
Miami-Miamian-Xenia	Deep, gently sloping to steep, well drained and moderately well drained soils; formed in thin loess and underlying glacial till.	Glacial till	2%
Morley-Markham-Ashkum	Gently sloping to steep, well drained to moderately well drained, deep soils that have moderately slow permeability; formed in outwash plains	Outwash plains	5%
Sawmill-Lawson-Genesee	Deep, well drained to very poorly drained, early level soils formed in alluvium; formed in loamy, alluvium on floodplains,	Loamy alluvium	0.50%
Saybrook-Drummer-Parr	Very deep, nearly level or gently sloping, poorly drained to moderately well drained, moderately fine or medium textured soils that formed in loamy outwash over glacial till	Glacial till plains	46%
Swygert-Bryce-Chatsworth	Somewhat poorly drained soils, nearly level to gently sloping, moderate sloping; formed in clayey till or clayey sediments on ground moraines and end moraines.	Ground and end moraines	1.50%
Warsaw-Lorenzo-Dakota	Well-drained soils, nearly level or gently sloping, moderately well-drained, medium textured soil; form in outwash plains and river terraces	Outwash plains and river terraces	11%
Wolcott-Odell-Corwin	Deep, nearly level, very poorly drained and somewhat poorly drained, medium textured soils, on outwash plains, lake plains and terraces	Outwash plains, lake plains, and terraces	11%

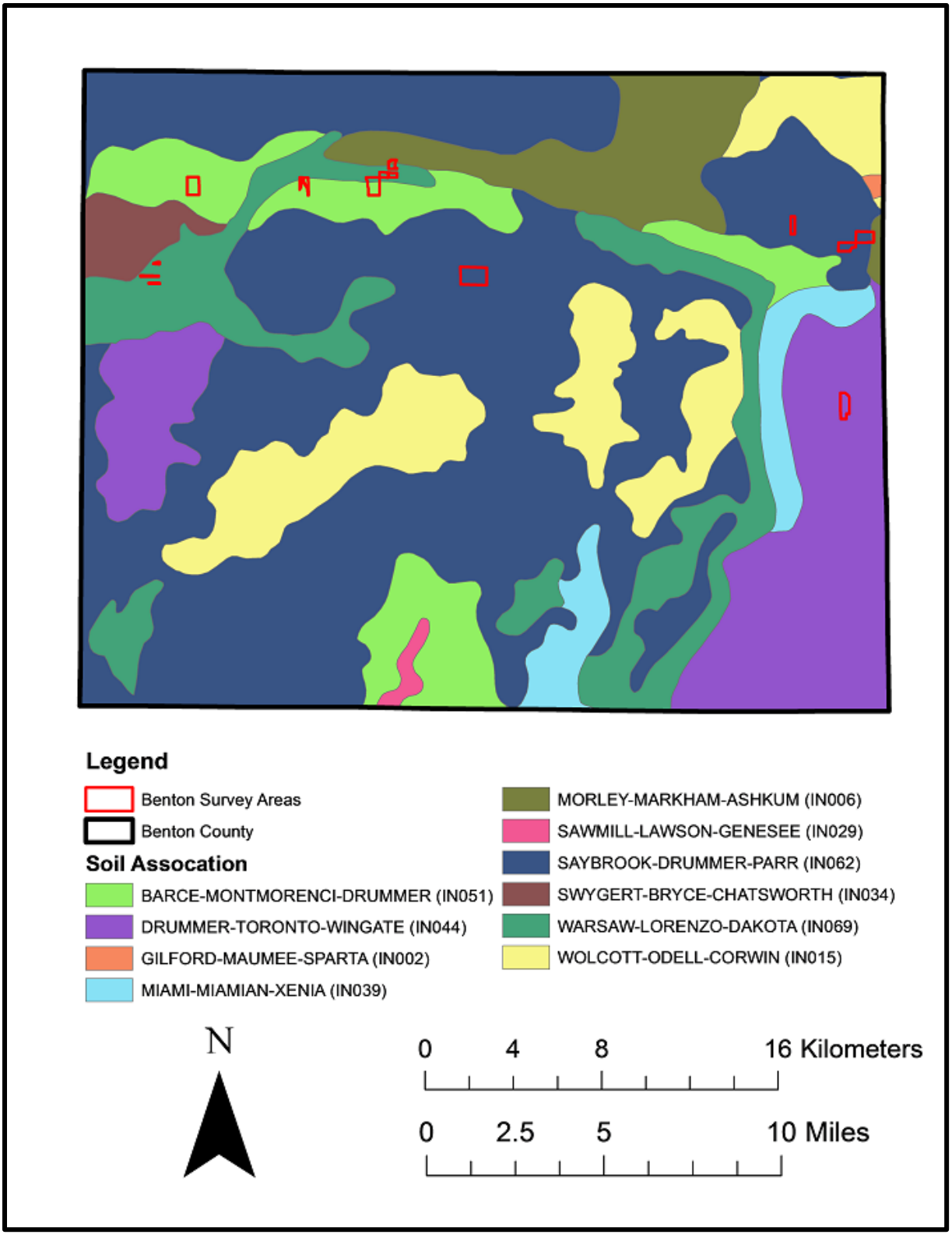

Figure 15: Soil Associations in Benton County (STATSGO, USDA/NRCS 2002).

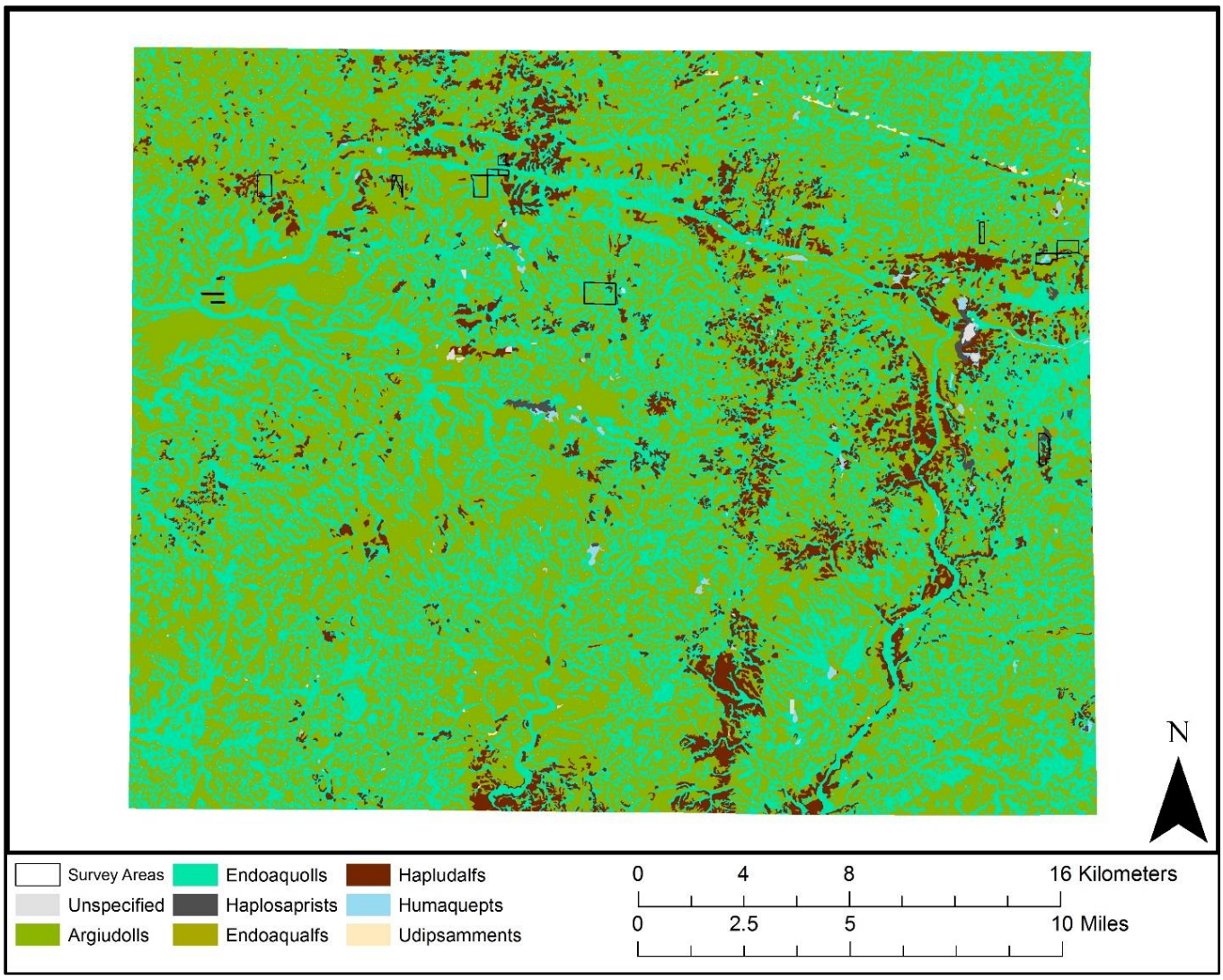

Figure 16: Soil Groups and Survey Areas within Benton County, Indiana (Soil Survey Staff 2013).

Water Resources

Precipitation is the primary source of surface water for Benton County (Hale 1966:92). Eight to 20 percent of precipitation becomes surface water as it collects in rivers, streams, lakes, and reservoirs (Bechert and Heckard 1966:100). The Wabash River, which lies in western Indiana and southeastern Illinois is the major water source running closest to Benton County (Bechert and Heckard 1966:92-93). The Wabash River, the longest in Indiana, drains two-thirds of the state's runoff water, carrying it southwest until it reaches the Ohio River (Bechert and Heckard 1966:92).

The county is drained by five main streams: Big Pine Creek, Mud Pine Creek, Sugar Creek, Mud Creek, and Carpenter Creek. While the Soil Survey of Benton County doesn't list any lakes or ponds in Benton County, the Indiana Department of Natural Resources Fish and Wildlife Indiana Lake Listing has one major manmade lake, Lake Boswell, and one major manmade pond, Fowler Pond (DNR Fish and Wildlife Lake Listing 2007:1). The water supply for Benton County is primarily ground water. The principal sources of water are deposits of sand and gravel near streams and layers of sand and gravel intermixed with glacial till, which overlies the Lower Mississippian bedrock (Barnes 1989:2). In the northeast and southeast corners of the county and in select areas along the southern boundary, the underlying bedrock is Upper Devonian black shale and a poor source of ground water (Barnes 1989:2).

The flow or "discharge" of rivers fluctuates greatly throughout seasons and over years. The maximum discharge is experienced during the late winter and early spring. Melt water from snow and increased precipitation at this time increases the discharge so much that at times flooding becomes a serious concern. Minimum discharge occurs during the summer and fall due to the effects of evaporation and transpiration by plant life. Roughly two-thirds of precipitation is lost due to this process. In contrast, maximum use of water also occurs during the summer and fall resulting in occasional drought (Hale 1966:94-95). In a landscape characterized by extensive wetlands, such as that found in prehistoric Benton County, these seasonal and annual precipitation fluctuations could have drastically influenced the size and location of habitable area (see e.g., Surface-Evans 2015; Surface-Evans et al. 2005). The fluctuation of precipitation also greatly impacts the percentage of prairie and agricultural land available for crops.

The remaining eight to 16 percent of precipitation percolates through the aeration zone of soil and rock until it reaches the water table where it becomes ground water (Bechert and Heckard 1966:100). Ground water moves laterally until it reaches a lower elevation. Eventually ground water will become surface water when it reaches an outlet (Bechert and Heckard 1966:110). Water resources are extremely important to both prehistoric and historic human habitation patterns. Due to Benton County being mostly comprised of nearly level and gently sloping ground moraines, the aquifers in this region are poor sources of ground water. The county has installed public water system near Ambia, Boswell, Earl Park, Fowler, Otterbein, and Oxford (Barnes 1989:2). With only ninety-five percent of Benton County consisting of cropland and permanent pasture, the water system is to mainly supply the developed areas of Oxford, Otterbein, Fowler, and Boswell (Barnes 1989:3).

Climate

The modern climate of Indiana is described as a humid, mesothermal-microthermal, continental climate (Newman 1966:171; see also Eichenlaub 1979 and Woods et al. 2003). This refers to Indiana's lack of average humidity less than 50 percent and cold winters and hot summers (Newman 1966:171). Northern Indiana is within the microthermal unit which has a

cool temperate climate like those found farther north and east, whereas southern Indiana is a part of the mesothermal unit which has a warm temperate climate similar to those areas in the south and west (Newman 1966:171). Eichenlaub (1979: 194, Figure 53) places this portion of the state just outside of the Great Lakes climate region with Benton County just on the edge of the *Dfb* Köppen region, with parts of the northeast county within this region. The *Dfb* Köppen region is characterized by cold and snowy forests, with no dry season, and relatively cool summers. Benton County is characterized by a coefficient of continentality of approximately 45-46 (Eichenlaub 1979:Figure 56) which is a measure of the sizeable influence of Lake Michigan on local climate. Since Benton County is located in northwestern Indiana, it experiences daily and seasonal variability in climate, with very cold winters and hot and humid summers due to some of the effects of Lake Michigan (Schaal 1966:166). Without Lake Michigan, northern Indiana would be much colder during the summer months due to the moisture in the air retaining heat, but the proximity to the lake also means that surface winds in the area are higher comparatively to other areas of Indiana (Schaal 1966:169).

Average rainfall for Benton County is 37 inches a year while average snowfall is 25 inches a year (Barnes1989:2; see also Woods et al. 2003). The mean minimum January temperature is 0 degrees Fahrenheit while the mean maximum January temperature is between 36 to 38 degrees Fahrenheit (Schaal 1966:162). Summer temperatures vary accordingly with intense heat, the mean minimum July temperature is 62 to 64 degrees Fahrenheit and the mean maximum July temperature is between 86 to 90 degrees Fahrenheit (Schaal 1966:162; see also Eichenlaub 1979).

Benton County is entirely within Level IV Ecoregion 54a (Figure 17) the Illinois/Indiana Prairies (IIP) which is part of the Central Corn Belt Plains (CCBP) Level III Ecoregion 54 (Woods et al. 2003). Mollisols dominate the CCPB, and the IIP is mostly prairies with aquolls more abundant (Woods et al. 2003; see also Figure 16).

Minor climatic properties may be influenced by natural features within the landscapes, creating variably hospitable small scale climatic zones. These features would have affected prehistoric and historic utilization of the local environment and created small scale preferential or detrimental climactic conditions. Newman (1966:174-176) refers to these areas as “meso-climates” and states that they are mainly caused by changes in wind patterns as a result of natural landforms such as major river valleys, the shore area around large lakes, high plateau areas and springs. These meso-climates, though very difficult to describe retroactively, may have played a part in the habitation patterns among prehistoric peoples.

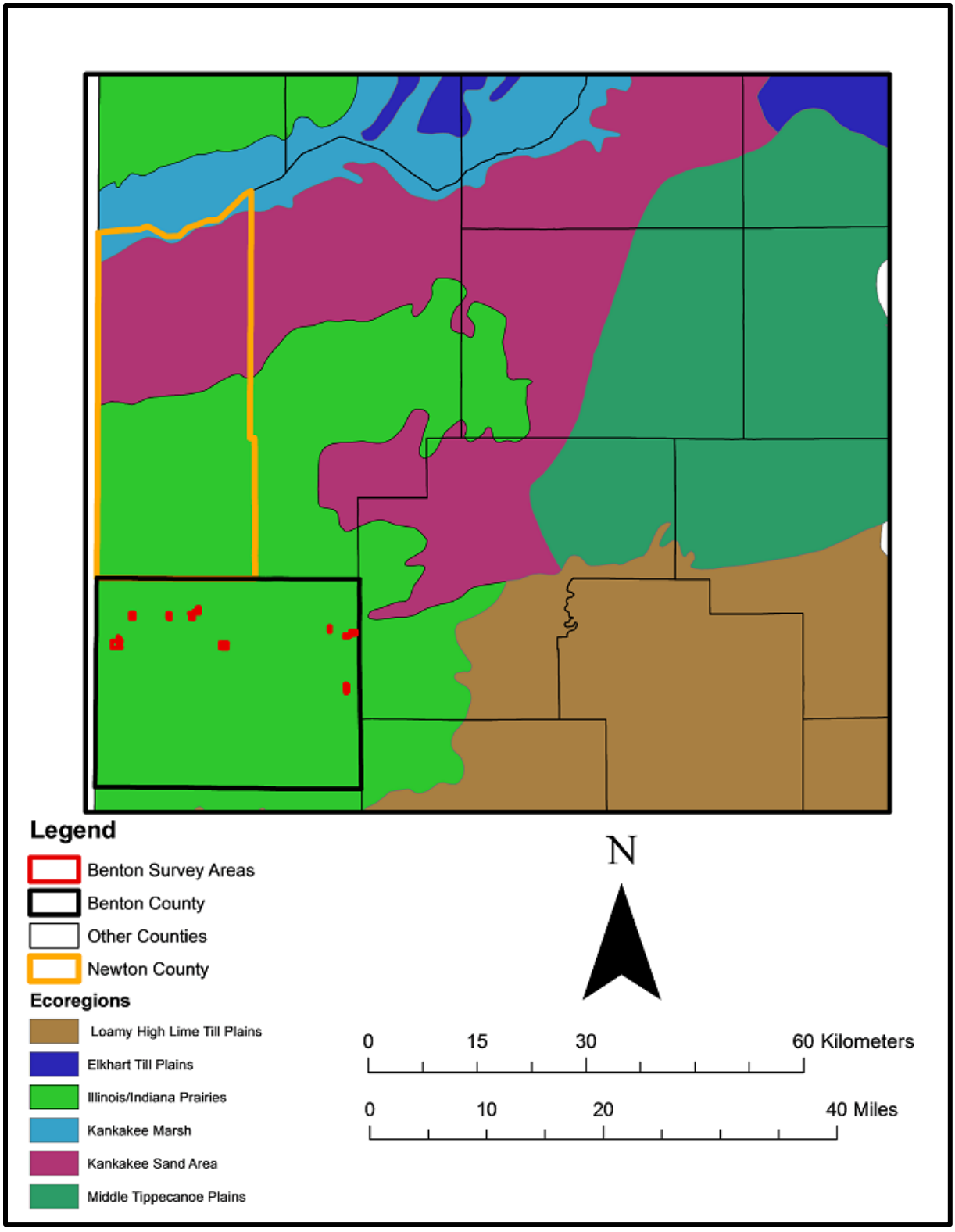

Figure 17: Level IV Ecoregions (Woods et al. 2003) for Northwest Indiana.

The modern climate of Indiana is not an accurate reflection of the climate over the last 12,000 years. As other archaeologists have noted (e.g. King 1993:236), the reconstruction of paleo-climates has been hampered by ambiguous climatic data that have been used to support conflicting interpretations. Climatic change has been documented and can be discussed in generally accepted terms.

Biotic Communities

Flora

As the climate shifted in Indiana after the end of the Pleistocene, so did the plant species. Figure 18 presents the transformation of the vegetative sequence constructed by Shane (1976) and adapted by Don Cochran (Cochran and Buehrig 1985:9, after Shane 1976; see also Bond et al. 2001; Shane et al. 2001) to reflect the general changes that took place within the region since the retreat of the glacial ice. Shane (1976; Shane et al. 2001) discusses regional changes within the Ohio valley that have broad scale implications for the U.S. Midwest and Great Lakes regions. The trends identified were a relatively rapid and dramatic change in vegetation from open parkland to closed forest was the result of a rapid acceleration in the rate of warming (Whitehead 1997:105). Figure 18 is a regional generalization and does not cover the project area specifically. It should be emphasized that vegetation varied greatly over time and space, and the introduction and conclusion of species across Indiana produced a forest with mixed vegetation (Whitehead 1997:105). Vegetative responses have not been recorded in sediments for the Great Lakes Region (Holloway and Bryant 1985:237).

With historic documentation, more detailed descriptions of the vegetation in northern Indiana can be given. Petty and Jackson's (1966) study of the natural vegetation of Indiana in 1816 shows Benton County as dry prairie interspersed with wetlands (Petty and Jackson 1966:284). This combination of wetlands with prairie created soils that were ideal for agriculture through accumulation of organic matter and nutrients in the topsoil (Petty and Jackson:288-292). To get the dark and fertile soil characteristic of Benton County requires centuries of production. With cool-season and warm-season plant species produced continuous, the prairie was one of the most productive ranges with enormous herds of buffalo (Petty and Jackson 1966:289). Early settlers assumed the prairie was infertile due to the lack of trees and those who did attempt to till the soil found it hard. Extensive cultivation of the prairie was impossible until the development of the steel plow circa 1840 (Petty and Jackson 1966:290).

Prairie is normally divided into three general types: wetland prairie, upland prairie, and areas were grassland and forest met. (Petty and Jackson 1966:290). Benton County is comprised mainly of wetland prairie and upland prairie. Indian tribes periodically fired the prairie to drive game and to maintain grassland to attract and support Buffalo herds. Five prairie community types have been identified in Benton County. These types included big bluestem, little bluestem, prairie dropseed, poverty grass-bluegrass, and slough grass and the distribution of these types is controlled principally but the nature of the soil drainage (Petty and Jackson 1966:291). Out of

these five, big and little bluestem are of the greatest importance and have the widest extent. Big Bluestem communities dominate lower moist slopes and are the most noticeably abundant prairie type in Indiana.

<table>
<tr><td>A.D. 2000</td><td rowspan="2">Historic</td><td rowspan="8">Deciduous Forest</td></tr>
<tr><td rowspan="2">A.D. 1000</td></tr>
<tr><td rowspan="3">Late Woodland</td></tr>
<tr><td rowspan="2">0</td></tr>
<tr><td>Middle Woodland</td></tr>
<tr><td>1000 B.C.</td><td>Early Woodland</td></tr>
<tr><td>2000 B.C.</td><td rowspan="2">Late Archaic</td></tr>
<tr><td>3000 B.C.</td></tr>
<tr><td>4000 B.C.</td><td rowspan="3">Middle Archaic</td><td rowspan="3">Prairies and Open Vegetation</td></tr>
<tr><td>5000 B.C.</td></tr>
<tr><td>6000 B.C.</td></tr>
<tr><td>7000 B.C.</td><td rowspan="3">Early Archaic / Late Paleoindian</td><td rowspan="2">Deciduous Forest</td></tr>
<tr><td>8000 B.C.</td></tr>
<tr><td rowspan="2">9000 B.C.</td><td rowspan="2">Pine Maximum</td></tr>
<tr><td rowspan="10">Early Paleoindian</td></tr>
<tr><td>10000 B.C.</td><td rowspan="2">Conifer-Deciduous Woodland</td></tr>
<tr><td>11000 B.C.</td></tr>
<tr><td>12000 B.C.</td><td>Boreal Forest</td></tr>
<tr><td rowspan="2">13000 B.C.</td><td>Park Tundra</td></tr>
<tr><td>Tundra or Open Areas</td></tr>
<tr><td>14000 B.C.</td><td>Periglacial Zone</td></tr>
<tr><td>15000 B.C.</td><td>Wisconsin Ice</td></tr>
</table>

Figure 18: Vegetation Sequence of Central Indiana (Cochran and Buehrig 1985:9, after Shane 1976).

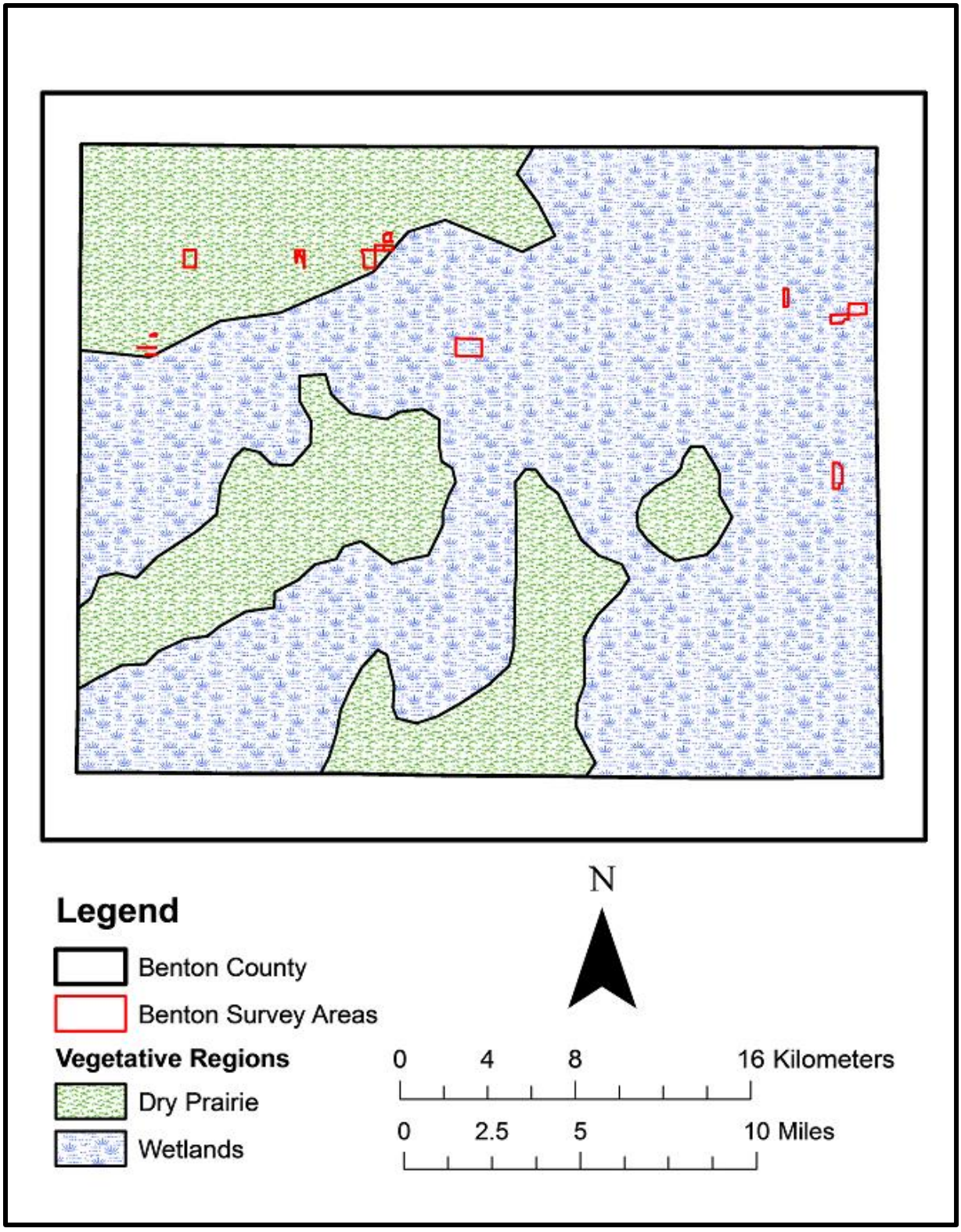

Figure 19: Pre-Euro-American Settlement Vegetation after (Petty and Jackson 1966).

The Prairie Peninsula, historically found in Northwest Indiana, once covered 13 percent of the Indiana landscape. In more recent times prairie lands of Indiana are predominantly found only in designated low maintenance areas such as settlement era cemeteries, and along highways and railroads. While prairie lands often appear to be simple grasslands, these lands have a complex system of both plants and animals within them. The development of prairies played a large part in the fertility of both Indiana and the United States as a whole. The species of plants that constituted the prairies in this area were a mix of both northern and southern species. These two groups grow and mature at different points throughout the year, allowing prairies to be successful vegetative communities in most seasons as well as to propagate fertile soils (Petty and Jackson 1966:288-289). Half of our survey areas were within the dry prairie in Benton County, while the other half were in the wetlands (see Figure 19). The intermingling of dry prairie and wetland may have fluctuated in the deeper past. A finer scale look at the soil groups present within the county shows a much more diverse and varied structure dominating the soil forming factors of the recent past (Figure 16).

In Indiana, wetland vegetative communities are advantageous for humans because of the wildlife and the plant life they house (Meyers 1997:69). Wetlands in Indiana display the highest diversity of life, including endangered species, of all local habitats. Wetlands are characterized as low lying, often poorly drained areas found between land and water. This includes swamps, bogs, fens, marshes, seep springs, sloughs, bottomland, potholes, wet meadows or prairies, and most areas that are found in the margins of lakes, reservoirs, rivers and streams. Wetlands offer ways for humans to control water based resources and indeed the resource of water itself. Wetland communities are decreasing within Indiana, including Benton County (Meyers 1997:67). Prehistorically, wetlands would have been economically important, and potentially attracted people from atypical distances seasonally. The fluctuations of surface moisture seasonally and through the centuries would have exerted a great influence on prehistoric activity distributions. Wetland communities in Benton County have decreased due to increasing number of agricultural and wind farms (Taylor 2009:3).

Fauna

The animals living in Indiana would have changed from the end of the Pleistocene through Holocene times. Various Pleistocene age fauna have been found in Indiana. Early twentieth century accounts list bison, giant beaver, caribou, Virginia deer, dire wolf, wapiti, horse, mammoth, mastodon, musk-ox, peccary, sloth and perhaps moose (Lyon 1936; Moodie 1929). More recent investigations have expanded this list to include moose, caribou, black bear, giant short-face bear, giant tortoise, white-tailed deer, Canada goose, armadillo, jaguar, sabertooth tiger and camel (Richards and Whitaker 1997:156).

The faunal arrangement greatly changed around 10,000 to 11,000 years ago with the extinction of many of the larger mammalian species. A rapidly changing climate combined with

the introduction of humans resulted in a reorganization of biotic communities (Richards and Whitaker 1997:151). In 1816, an estimated 66 species of mammals were present in Indiana (Mumford 1966:475). Some of the common mammals found in Indiana include opossum, eastern cottontail, eastern chipmunk, white-tailed deer, beaver, deer mouse, white-footed mouse, meadow vole, pine vole, muskrat, southern bog lemming, Norway rat, coyote, red fox, gray fox, raccoon, long-tailed weasel, various species of squirrels, mice and shrews. Twelve species are listed as exterminated from Indiana and include bison, wapiti, porcupine, gray wolf, red wolf, black bear, fisher, eastern spotted skunk, wolverine, river otter, mountain lion and lynx (Mumford 1966:475).

Historic sources also report a large variety of other fauna in Indiana. Webster (1966:455-473) identifies 366 species of birds. A total of 177 fish have been identified in the state (Gammon and Gerking 1966:401-425). Approximately 200 species of mollusks and 400 species of crustaceans occurred in Indiana waters. Approximately 82 species of amphibians and snakes have been identified (Milton 1966:426-451). The species can be subdivided into 19 species of salamanders, two species of toads, 11 species of frogs, six types of lizards, some 30 types of snakes, and 14 turtle varieties (Milton 1966:426-451).

Summary

As the ecological and natural setting of the project area changed and evolved over the last several thousand years, human settlement would also have changed. Settlement and use of resources within the project area would have been influenced by potential plant and animal resources and, conversely, may have influenced changes in flora and fauna (Delcourt and Delcourt 1991:87-89). The diversity of habitats that existed in the project area would have attracted prehistoric populations for the wide variety of natural resources available as food, water sources, and raw materials in the production of tools, clothing, adornment and shelter.

Archaeological Background

In this section, the archaeological background of Benton County is reviewed. The background information was analyzed for data relevant to an understanding of archeological resources expected to be found during this investigation both in terms of the types and densities of archaeological data, as well as the history of the landscape. A records review was conducted at DHPA by Christine Thompson on June 15, 2015. The results of this review are presented in Table 2, which provides the references for previous surveys as well as the number of surveys conducted and those successful in locating sites. Following Swihart and Nolan's (2013, 2014) procedure, the results are segregated by civil townships, which are shown in Figure 20. The Positive column indicates the number of surveys that encountered artifacts and reported any sites. The S/P column is a ratio of the number of surveys conducted by the number of surveys that were positive. The P/S column is a ratio of the number of positive surveys to total surveys.

These ratios give an approximate index of the average density of the archaeological record in the county and in each civil township. The results show that sites are encountered in about one in every 6.33 surveys in Benton County with an average positive density of 0.16. Prior to the current survey, 96 sites (Volume 2, Appendix A) had been recorded in Benton County. Summaries of site components and projectile points recovered from the area are presented in Table 3, Table 4, and Table 5.

The information in Table 2 and Figure 20 shows the highest frequency of surveys in Center and Parish Grove Townships, mostly due to the development and installation of wind farms. The townships with the least amount of surveys (Gilboa, Hickory Grove, Oak Grove, Pine, Union, and York) have very little landscape development outside of farmland, which could account for the lower number of mandatory surveys. Grant, Oak Grove, and Richland townships have the highest density of positives with at least 25 percent of surveys encountering sites. Gilboa Township has had no previous archaeological surveys, and Bolivar and Parish Grove Townships have the lowest density of positives with 10 percent or less of surveys encountering sites.

With a ratio of one positive survey for every 6.33 CRM projects (Table 2), Benton County exhibits low relative abundance of archaeological resources compared to an S/P ratio of 2.8, 2.7, 1.94, and 3.33 for Jasper, Dearborn, Hamilton, and Newton Counties, respectively (Leeuwrik et al. 2016; Macleod et al. 2015; Swihart and Nolan 2013, 2014). This is accounting for the relatively low amount of archaeological investigations that have taken place in Benton County compared to counties like Hamilton County in central Indiana, Dearborn in southern Indiana, and Montgomery in west central Indiana (James and Cochran 1985; Macleod et al. 2015; Murray et al. 2011; Swihart and Nolan 2013:Table 3, 2014:Table 2). The lower levels of development and construction that has taken place within Benton County could account for the lower frequency of state and federal surveys conducted. The first federally mandated survey within Benton County did not take place until 1976 (DeRegnaucourt 1977).

Archaeological investigations in Benton County have been predominantly oriented toward surface surveys and only a small percentage of sites have been tested or excavated. Per SHAARD (Division of Historic Preservation and Archaeology 2015), there have been no Phase II or Phase III surveys in Benton County.

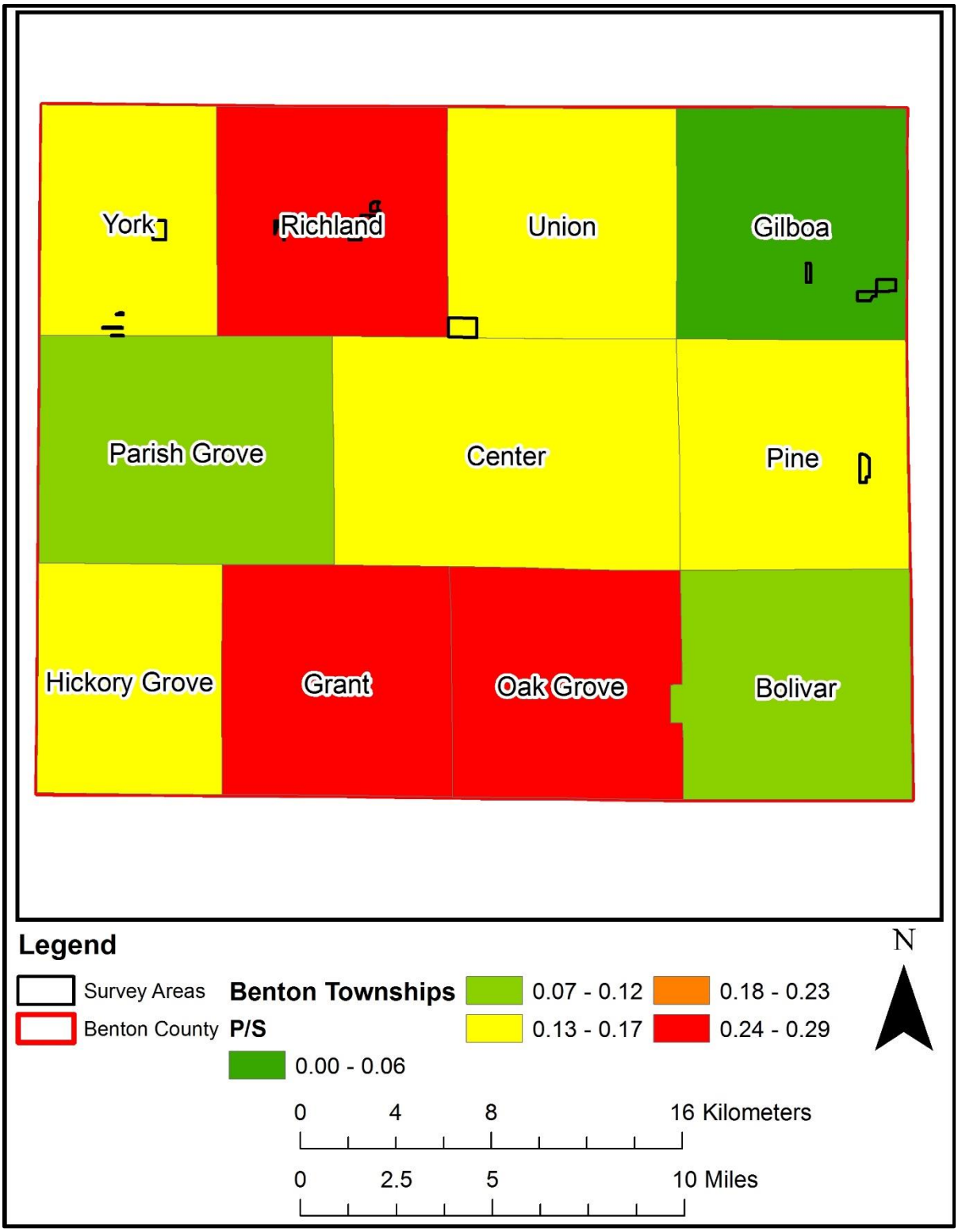

Figure 20: Ratio of Positive Surveys to Total Surveys by Civil Townships in Benton County (USGS 7.5' Washington, Indiana Quadrangle).

Table 2: Summary of Previous Surveys in Benton County.

Civil Township	# of Surveys	Positive	S/P	P/S	References
Bolivar	14	1	14	0.07	(Conover 1985a; Carson and Plunkett 2007; Dickerson 2014; Dietrich 1985; Evans 1988; Greenhouse et al. 2001a; Helmkamp and Javorsek 2000a; Johnson and Poulton 2007; Kolbe 1992; Ritchey 1991; Scuoteguazza 1995; Stewart 1994; Stillwell 2007; West 1988)
Center	22	3	7.33	0.14	(Beard 1980; Carson and Plunkett 2007; Cochran 1984, 2000; Fishel 2000; Greenhouse et al. 2001b; Hall et al. 2007; Helmkamp and Javorsek 2000b; Holycross 1999; Jackson 2013, 2014; Lautzenheiser and Carson 2013; Johnson and Poulton 2007; Leffler 1981; Mayronne 2000; McGowan 2013a; Munson 1980; Pace 1987; Stillwell 2004a, 2004b, 2015; Whalen 2003)
Gilboa	0	0	0	0	None
Grant	11	3	3.67	0.27	(Carmany-George 2006; Carson and Plunkett 2007; Cochran 1979; Culver and Bubb 2014; Hall and Smith 2009; Hicks and Carino 1978; Hicks and Cochran 1978; Johnson and Poulton 2007; Lautzenheiser and Carson 2013; Martin 2000a, 2000b)
Hickory Grove	7	1	7	0.14	(Carson and Plunkett 2007; Hall and Smith 2009; Helmkamp 1992; Johnson and Poulton 2007; King 2011; Miller 2010; Reid 2001)
Oak Grove	7	2	3.5	0.29	(Carson 2007; Carson and Plunkett 2007; Helmkamp and Javorsek 2000c; Johnson and Poulton 2007; Laswell 2007; Stillwell 2013; Rotman 1998)
Parish Grove	21	2	10.5	0.10	Anuszczyk 1983a, 1983b, 1983c; Beard 1990; Burkett 1983a, 1983b, 1983c; Carson and Plunkett 2007; Coon 2008; Crider and King 2005; Gaw 1993; Hall and Smith 2009; Holycross 2001; Jackson 2013, 2014; Johnson and Poulton 2007; Lautzenheiser and Carson 2013; Martin 2000c; Plunkett 2013; Tomak 1979a; Whalen 2003)
Pine	8	1	8	0.13	(Anuszczyk 1983d, 1983e; Burkett 1983d, 1983e; Carson 2003; DeRegnaucourt 1982; Holycross 1998; King 2004)
Richland	12	3	4	0.25	(Carson and Plunkett 2007; Greenhouse et al. 2001c; Jackson 2013, 2014; Johnson and Poulton 2007; Lautzenheiser and Carson 2013; Martin 2000d; McCord 2009; McGowan 2013b; Smith 2009; Stillwell 2005; Zoll 2013)

Union	6	1	6	0.17	(Carson and Plunkett 2007; Helmkamp 1991; McCord 2008, 2009; Poppe 1993; Smith and McCord 2008)
York	6	1	6	0.17	(Armstrong 1980; Conover 1985b; DeRegnaucourt 1977; Martin 2000e; Tomak 1979b, 1979c)
Total	**114**	**18**	**6.33**	**0.16**	
Average	**10.36**	**1.64**	**6.33**	**0.16**	

Table 3: Site Components Recorded Within Benton County (Prior to Survey).
***bold period headings include all sub-periods**

Component	No.	Number of Multicomponent sites included in total
Unidentified Prehistoric	**44**	**1 Multicomponent**
Paleoindian	**6**	
Archaic	**25**	**7 Multicomponent**
Early Archaic	7	2 Multicomponent
Middle Archaic	4	4 Multicomponent
Late Archaic	11	6 Multicomponent
Unknown Archaic	3	1 Multicomponent
Woodland	**5**	**3 Multicomponent**
Early Woodland	1	1 Multicomponent
Middle Woodland	1	1 Multicomponent
Late Woodland/Mississippian	3	2 Multicomponent
Unknown Woodland	0	
Mississippian	**2**	**2 Multicomponent**
Protohistoric/Contact	**0**	
Historic	**12**	**1 Multicomponent**
Unknown	**6**	

Table 4: Previously Documented Points within Benton County (Prior to Survey).

Cultural Period	Projectile Point Types
Paleoindian	Clovis, Dalton
Early Archaic	Barbee Corner Notched, Dovetail, Hardin Barbed, Kirk Corner Notched, Palmer, St. Charles, Thebes
Early-Middle Archaic	Raddatz Side Notched
Middle- Late Archaic	Unidentified Concave Base, Unidentified Side Notched
Late Archaic	Brewerton, Durst, Lamoka, Matanza, Riverton, Vosberg Corner Notched, Unidentified Side Notched, Unidentified Expanding Stem
Terminal Late Archaic	N/A
Early Woodland	Perkiomen Broad, Susquehanna Broad
Middle Woodland	Snyder
Late Woodland/ Late Prehistoric	Jack's Reef, Unidentified Side Notched

Table 5: Site Types Recorded Within Benton County (Data from SHAARD, CRM, and research reports prior to survey).

Prehistoric Types	No.	Historic Types	No.
Lithic Scatter	14	Agricultural Field	2
Habitation	12	Bridge	1
Camp	18	Commercial	1
Mound	1	Farmstead	1
Isolated Find	18	House	3
Unknown	15		

There have been 90 archaeological investigations conducted in Benton County. A Phase Ia investigation of 67.9 acres was conducted by the Archaeological Resource Management Service from Ball State University in 1989 within the townships of Gilboa, Earl Park, and York (Maust and Cochran 1989:1). Within the project areas were no previously recorded sites and this investigation discovered three new sites (Maust and Cochran 1989:12). Benton County has had three Phase Ia surveys conducted in preparation for wind turbine installation at two wind farms. These wind farms are owned by BP Alternative Energy North America (BP AENA). As of 2015, wind farm surveys have found 17 (18%) of the 96 listed sites in Benton County.

In 2007, Environmental Resources Management (ERM) conducted a Phase Ia survey for the BP Alternative Energy North America (BP AENA) Fowler Ridge Wind Power Project. The entire project area covered approximately 562 acres of privately owned land, spanning Fowler, Mount Gilboa, and Templeton Townships (Hall et al. 2007:iii). A total of 399 proposed turbine locations within the project area were surveyed with survey areas including a 150-feet radius for each wind turbine location, a 100-foot corridor for each access road, and a 100-foot corridor for each electrical transmission line. Nine sites were discovered consisting of six isolated prehistoric lithic finds (12-Bn-78, 12-Bn-79, 12-Bn-82, 12-Bn-83, 12-Bn-84, and 12-Bn-85) and three historic scatters (12-Bn-77, 12-Bn-80, and 12-Bn-81) associated to the late-nineteenth and early-twentieth centuries (Hall et al. 2007:18).

In 2009, Environmental Resources Management (ERM) conducted a Phase Ia survey for the BP Wind Energy North America's (BP WENA) Fowler II Wind Farm Project. The entire project area consisted of privately owned land spanning Fowler, Mount Gilboa, and Templeton Townships (Hall and Smith 2009:1). A total of 141 proposed turbine locations were surveyed, and the survey areas consisted of a 150-feet radius circular arc for each wind turbine location, 100-foot corridor for each access road, and 100-foot corridor for each electrical transmission line. The total survey area encompassed approximately 1,104 acres (Hall and Smith 2009:1). Seven sites were discovered consisting of five low-density prehistoric lithic sites sites (12-Bn-

87, 12-Bn-88, 12-Bn-90, 12-Bn-91, and 12-Bn-92) and the two early to mid-twentieth century historic scatters (12-Bn-86 and 12-Bn-89) (Hall and Smith 2009:16).

In 2013, Archaeological Consultants of the Midwest conducted a Phase 1a survey for the proposed Fowler Phase IV Farm Project. The entire project area covered approximately 16,500 acres of privately owned land, spanning Center, Parrish Grove, and Richland Townships (Jackson 2013:1). A total of 93 proposed wind turbines locations were surveyed with survey areas including a 150-feet radius circular are for each wind turbine location, 100-foot corridor for each access road, and 100-foot corridor for each electrical transmission line (Jackson 2013:1). One site (12-Bn-96) was discovered and consisted of a unidentified prehistoric isolated find.

All other surveys and investigations that have been conducted within Benton County were smaller than 35 acres and have documented little to no cultural materials. Of the 96 sites recorded in SHAARD for Benton County prior to this survey, 58 (60%) are collector reported sites. Of these 58 sites, 46.55 percent (n= 27) of sites contained one or more diagnostic prehistoric artifacts and were identified within a cultural time period. The Late Archaic period was most prevalent with 18.97 percent (n=11) of collector reports sites displaying a Late Archaic component. Early Archaic was the second most prominent time period (n=7), following by the Paleoindian time period (n=6). Collector reported sites add greatly to the construction of prehistory in Benton County, with 93.1 percent of sites with identified prehistoric cultural components attributed to collector information (Division of Historic Preservation and Archaeology 2015). This disparity emphasizes the dire need for broader systematic survey in Benton County.

Culture History

In Benton County, sites and site components indicate that Native Americans inhabited the region from the Early Archaic period through the Historic period. Given the above described environmental background we can expect highly variable density of artifacts over space due to the interrupted distribution of habitable areas interspersed with wetlands, and a variable distribution through time as moisture levels fluctuated during the Holocene.

The majority of sites documented in Benton County are of unknown cultural affiliations. Of the known periods of occupation, the most frequently identified has been Unidentified Prehistoric (n=44), followed by the Historic (n=12), and Late Archaic (n=11) (Division of Historic Preservation and Archaeology 2015). The prevalence of historic sites is to be expected as historic occupations typically display better preservation and a larger footprint than most prehistoric sites.

Paleoindian cultures are seen in Indiana around 10,000-8,000 B.C., with the recession of the Wisconsin glaciers (Jones and Johnson 2008:2; Smith et al. 2009:21; Swartz 1981:4). Paleoindian sites generally occur as small surface scatters due to the fact that most these groups were small family bands following herds and moving between resource patches. Originally thought to be specialized hunters of Pleistocene megafauna, recent discoveries reveal they likely subsisted more on smaller game and forage, opportunistically taking down megafauna (Grayson and Meltzer 2003:588; Waguespack and Surovell 2003:348). Artifacts from this time include fluted Clovis points, un-fluted Agate Basin, Hi-Lo, Holcombe, Plainview and Dalton points (Justice 2006). There are six previously documented Paleoindian sites (12-Bn-02, 12-Bn-03, 12-Bn-33, 12-Bn-34, 12-Bn-35, and 12-Bn-36) in the SHAARD database within Benton County. All six of these sites were collector reported (Division of Historic Preservation and Archaeology 2015).

In the Early Archaic (ca. 8,000-6,000 B.C.) the warming climate caused changes in the ecology forcing local inhabitants to adapt their livelihood to the changes in the environment. This roughly corresponds to the onset of the Holocene. The changing climate caused changes in the flora and fauna of the region (Shane 1976; Shane et al. 2001; Smith 1986:71). This offered more varieties of plant life and brought about the last extinctions of megafauna which had begun to die off during the terminal Pleistocene (Grayson and Meltzer 2003:588). Technological changes in tools and techniques occurred during this time including new hafting techniques and ground stone tools (Smith 1986:72). Seven Early Archaic sites (12-Bn-10, 12-Bn-11, 12-Bn-13, 12-Bn-17, 12-Bn-18, 12-Bn-20, and 12-Bn-93) have been found in Benton County. All seven of these sites were collector reported (Division of Historic Preservation and Archaeology 2015).

During the Middle Archaic (ca. 6,000-3,000 B.C.), the climate, associated with the Hypisthermal or Holocene Climatic Optimum, became increasingly warmer and drier (e.g., Robertson 2011:183), bringing more variety and stability for food resources. Stone tools became more diversified in this era and side notched points become more prevalent (Stafford and Cantin 2009:299). Four Middle Archaic sites (12-Bn-13, 12-Bn-19, 12-Bn-21, and 12-Bn-93) have been documented in Benton County. All four of these sites were collector reported (Division of Historic Preservation and Archaeology 2015).

During the Late Archaic (ca. 3,000-1,000 B.C.), the climate stabilized, approximating more modern conditions and the environment stayed deciduous forest. Late Archaic sites are very widely found and are generally multicomponent (Miller 1941:60; Smith et al. 2009:22). The exact nature of the Late Archaic sites is unclear, but seasonal occupation is assumed. Some cultivation of native plants and indications of trade routes occur. Pestles, axes, adzes, celts, bannerstones, gorgets and other groundstone artifacts are predominant in this period (Miller 1941:58; Smith and Yarnell 2009:22). Matanzas points make up the majority of Late Archaic points found in assemblages in Indiana (Stafford and Cantin 2009:305). Burials of the Late Archaic period in Indiana are the most represented of all Archaic subdivisions. Grave items

during this time were typically found to be segregated based on age and sex, although grave goods are typically not found with infant burials (Stafford and Cantin 2009:308). Eleven Late Archaic sites (12-Bn-07, 12-Bn-08, 12-Bn-12, 12-Bn-14, 12-Bn-19,12-Bn- 21, 12-Bn-24,12-Bn- 25, 12-Bn-26, 12-Bn-59, and 12-Bn-93) have been recorded in Benton County. All eleven of these sites were collector reported. (Division of Historic Preservation and Archaeology 2015).

The Terminal Late Archaic (ca. 1500-700 B.C) is characterized by the relative decrease in hunting and gathering practices, an increase in horticultural dependence and the some initial pottery production. Terminal Late Archaic Sites in Indiana are often from what is called the Riverton culture, though no Riverton culture sites or Terminal late Archaic sites have been confirmed in Benton County. This period is known for barbed points (Justice 1987) and for being the transitional period into the Early Woodland era. During this transitional time people were often living on rivers and other major water sources. (Jones and Johnson 2008:7; Mensforth 2001:123; Pedde and Prufer 2001).

The Early Woodland period (ca. 1,000-200 B.C.) is when pottery was introduced in North America (Montet-White 1968:5). Hunting and gathering continued during this period but horticulture continued to be practiced more frequently (Black 1936:298-299). The Adena culture is the most prominent cultural phenomena during this period and encompassed a region including Indiana, Kentucky, and Ohio. As this period saw the inception of ubiquitous and widespread ceramics, pottery can be one of the most indicative features of Early Woodland cultures (Black 1936:287-189). Many Adena sites also include burial mounds as evidenced by the presence of log tombs in mounds, such as the Nowlin Mound in southeastern Indiana, at characteristically Adena sites (Black 1936:297; Ruby 1994). Two Early Woodland sites (12-Bn-14 and 12-Bn-93) have been documented within Benton County. Both of these sites were collector reported (Division of Historic Preservation and Archaeology 2015).

Middle Woodland period (ca. 200 B.C.-600 A.D.) subsistence and settlement patterns are roughly consistent with that of the Early Woodland within Indiana. Sites tend to be located in close proximity to a ponds, swamps, and drainage ways, and are relatively consistent in location and distribution (Montet-White 1968:18-19). Hunting, gathering, and some horticulture were the main forms of subsistence during this period (Abrams 2009; Montet-White 1968:18-19). Horticulture during the Middle Woodland period mainly consisted of plants such as sunflower, goosefoot, and marshelder. This period saw the rise of the Hopewell culture and extensive trade networks (Caldwell 1964; Mangold 2009; Seeman 1979; Struever 1964). Maize was introduced around this time in the Midwest though predominantly as a supplemental crop as opposed to a staple. No evidence of maize has been recovered from this time in Indiana though regional neighbors have exhibited some (Hart 1999; Riley et al. 1994:496). Extensive trade networks are also identifiable through exotic artifacts and botanical remains (Mangold 2009:198; Seeman 1979). Lithics found in the Middle Woodland include Snyder's, Lowe, Chesser, and Steuben points and lamellar bladelets (Justice 1987; Montet-White 1968:179).

Within Benton County, only one Middle Woodland site (12-Bn-93) has been documented. It was collector report (Division of Historic Preservation and Archaeology 2015).

Within Benton County is one Indian mound (PA-Bn-1/12-Bn-1) and another possible mound (PA-Bn-2). Both mounds are located in the Grand Prairie section near minor streams in the Middle Wabash-Little Vermillion Watershed. Temporal information about the mounds in limited and Coon (2008:8) "assumes" PA-Bn-1 (12-Bn-1) to be Middle Woodland but cannot temporally place PA-Bn-2. Mound PA-Bn-2 is thought to be historic, but grave disturbance after Chief Pierre Morin's burial makes dating difficult (McCord and Cochran 2015, Appendix A:15-17).

In the Late Woodland period (ca. 600-1200 A.D.), the first bows and arrows were most likely introduced and eventually became the dominant weapon type (Seeman 1992:44). The first true arrow points were modifications of Middle Woodland side or corner notched points, comprising types such as Jacks Reef and Raccoon Corner Notched (see Justice 1987). Maize became a more stable dietary constituent in the Late Woodland diet along with the continued consumption of other plant foods found in the earlier Woodland periods such as maygrass, goosefoot, and knotweed (Greenlee 2002:12). Domestic crops such as maize became increasingly important to subsistence during this period especially after 800 A.D. (Hart 1999:8; Shott 1993; Swartz 1981:59). In much of Indiana the Late Woodland period is synonymous with the Albee Phase (ca 800-1300 A.D.; see Redmond and McCullough 2000:652-662). While no Albee sites have been reported in Benton County the known distribution extends into Warren County and encompasses much of the nearby Wabash River watershed (Redmond and McCullough 2000:Figure 24.13). Albee occupations have yielded distinctive ceramics and Jacks Reef, Raccoon Notched, and Triangular Cluster projectile points. Only three Late Woodland sites (12-Bn-07, 12-Bn-22, and 12-Bn-93) have been found in Benton County. The three sites were collector reported (Division of Historic Preservation and Archaeology 2015). The low numbers of Woodland and later sites in Benton County is nearly a reversal of the temporal patterns of other counties. This bias could be due to small sample size, or it could really represent a different pattern of use (or avoidance of the region) at various times due to either cultural or environmental limits.

The Late Woodland/Mississippian period (ca. 400-900 AD.) has the same characteristics as Late Woodland but shows adaptations toward a more focused agriculture; generally towards corn, but also squash and beans. Village sites show segregated activity in villages and triangular points are most frequently evident during this period (Redmond and McCullough 2000:656). The Vincennes culture of southwestern Indiana, and the Fisher and Huber cultures of northwestern Indiana can be considered indicative of post-Middle Woodland occupations, but also of Mississippian cultural affiliation (Redmond and McCullough 2000:643). Two Late Woodland/Mississippian sites (12-Bn-07 and 12-Bn-93) have been documented in Benton County. Both sites were collector reported (Division of Historic Preservation and Archaeology 2015).

The Mississippian period (ca. 1000-1650 AD) persisted up to and past European contact and was a period of change and transition with Native American groups (Munson et al. 2006:7; Faulkner 1972:13). A few of the cultures that were prominent during this period are quite well known for their societal structures and pottery. Mississippian era archaeological sites in western and southern Indiana are commonly found with several aspects that are considered "classic" Mississippian features like platform (truncated) mounds, public and ceremonial architecture, plazas, nucleated villages/towns with nearby hamlets and farmsteads, palisaded settlements, cemeteries, intensive agriculture, and societies with hierarchical social organizations (Benson et al. 2009:468-469; Redmond and McCullough 2000:648). Only two sites (12-Bn-07 and 12-Bn-93) of the Mississippian cultural affiliation has been discovered in Benton County and both were collector reported sites (Division of Historic Preservation and Archaeology 2015).

The Protohistoric period (post 1500 A.D.) is the transitional period as the first European settlers began to arrive in the Americas and have first contacts with the Native Americans. This period is characterized by indirect contact with Euro-Americans and the first written accounts of the area by external observers. As such these types of sites often include both Native and European-derived materials. Though often not in direct contact, material goods, in addition to knowledge of Euro-American settlers had an influence on native life. Protohistoric sites are best identified when the site is undisturbed and contains both historic and prehistoric materials. This is evidence that these two cultures were in the location at the same period in time. Three Native American groups of the Protohistoric period are documented in the areas around Benton County. The Potawatomi, Kickapoo, and Miami groups were recorded to live in the north and northwest of the state, near Benton County along with a Delaware tribe, which had relocated to the area ca. 1795 (Taylor 2009:12).

Benton County has an abundance of unidentified prehistoric and historic sites. Forty-four out of the 96 SHAARD documented sites (45.8%) are listed as either unidentified prehistoric or unknown. Twelve SHAARD documented sites (12.5%) were listed as historic sites. Within the 58 collector reported sites, 53.45 percent (n=31) were unidentified prehistoric or unknown cultural affiliation and there were no historic collector reported sites. In comparison, Newton County, immediately to the north of Benton County, has 267 documented sites listed in SHAARD, with 138 (51.7%) unidentified prehistoric sites and 92 (34.5%) historic sites (Leeuwrik et al. 2016).

Late in the Mississippian period, much of Indiana was reportedly depopulated of Native Americans. Contact with Europeans that resulted in epidemic diseases and warfare associated with the fur trade are believed to be key factors in the abandonment of the region (Heistand 1951:8). In the early 1800's Native Americans inhabiting Indiana began to cede their land rights and were moved, often forcefully, to reservations within the state or out west. The largest western removal took place in 1838 and moved much of the local tribes to Kansas. This pattern continued until 1840 when all commonly held reserve lands had been ceded and Indiana was open for Euro-American Settlement (Heistand 1951:8-9; Taylor 2009:12).

Historic

In the times before European settlers made their way to Benton County, multiple Native American groups, like the Miami, Kickapoo and Potawatomi, populated the area. The Miami occupied the area as early as 1670 and other tribes, such as the Kickapoo and Potawatomi, formed alliances with the Miami in 1770 (Taylor 2009:12). More Indian tribes were forced into the area due to white settlement and these additional tribes disrupted the Indian alliances. Relations between the different Indian tribes continued to disintegrate with various tribes taking sides during the French and Indian and Revolutionary War (Taylor 2009:12-13). Following defeat at Battle of Tippecanoe, Native Americans were forced out of the state and by 1838, the Native American population no longer occupied their original lands. Many old county maps from this period still show the "Old Indian Boundary" line, which cuts through Benton diagonally, along with the Potawatomi Trail to Chicago (Guernsey 1932). Benton County was established in 1840.

The General Land Office survey notes (1795-1840) and maps illustrate many of the cultural resources that were once within Benton County. Two Indian villages, one Native American agricultural field, and one trail are recorded on the General Land Office maps of Benton County (Maust and Cochran 1989). Benton County currently has 779 historic structures throughout the county (Taylor 2009:17). Many of the old, historic schools and churches have either been torn down or are considered endangered and could be lost to future development (Taylor 2009: 15).

European settlers have been in Benton County since c.1795, arriving during the same time period as the migration of the Delaware Indians into Benton County. European settlement was slow due to the isolation of Benton County. The European settler population stayed very low until 1840, when Benton County was officially established. Increased population in the county followed. Benton County is part of the region referred to as the Grand Prairie, with rich fertile soils making it ideal for farming. Initially, cattle farming dominated the landscape, with farmers making use of the abundant prairie grass. But mid-1800s, farmers began to drain low-lying areas to expose the rich black soil (Taylor 2009:12-13). Population increased in 1871 with the establishment of the railroad along the old Indian trails and in 1882, the Indiana and Chicago Railroad laid tracks through Oxford, creating a way for farmers to have easy shipping (Taylor 2009:12-13). Over the years, Benton population has continued to grow, but not substantially. The county still remains rural and sparsely populated. Major roadways, such as US 41, US 52, and I-65, link Benton County to major cities and ports (Taylor 2009:15).

The future of Benton County includes green technology in the form of wind farms and ethanol plants. The county is home to some steel manufacturing, but farming will always be the main economic stimulant (Taylor 2009:15). Due to Benton County's terrain and lack of

industrial development, much of the county consists of agricultural fields sown with corn, soy bean, and cover crops (Jackson 2013). This open, relatively flat glacial outwash plain is conducive for the generation of high winds, especially in Center Township around the town of Fowler (Jackson 2013). Alternative energy methods and wind farms were first introduced in Benton County in 2007 and it is projected that more and more farmers will opt for the installment of wind turbines upon their land. As of 2015, six Phase 1a surveys have been conducted in Benton County for the installment of wind turbines for two wind farms: BP Alternative Energy Wind Farm and Fowler Ridge Wind Farm (Carson and Plunkett 2007; Hall and Smith 2009; Hall et al. 2007; Jackson 2013, 2014; Johnson and Poulton 2007). As of 2015, more than 65,000 acres of private land were surveyed in Benton for wind turbine installation (Division of Historic Preservation and Archaeology 2015).

Archaeological Survey

Introduction

841.29 acres (340.46 hectares) of agricultural land were surveyed by pedestrian transects during this project. The entire survey area was located on till plains/moraines. The survey documented 85 new archaeological sites and recovered 81 prehistoric artifacts and 442 historic artifacts. No human remains were discovered as a result of this grant project. The results are discussed by survey area below.

Methods

Field Survey

For this project, approximately 800 acres of pedestrian survey were initially proposed. It was anticipated that by surveying 800 acres, approximately 100 to 150 new sites would be discovered to increase the existing site database. Our planning projected that different landforms and environmental zones consisting of ground moraines, end moraines, flood plains and outwash terraces/plains would be systematically surveyed. Areas were selected for survey using topographic maps, aerial maps, soil information, historic sources and reconnaissance information. The survey was constructed to sample different regions within the project area, with an emphasis on the northern portion of the county. Cultivated fields with optimal visibility were sought for survey. Ultimately, landowner permission and field visibility dictated the areas sampled by this survey which included approximately 841.29 acres of ground and end moraines, flood plains and outwash terraces/plains.

This project was conducted by AAL Archaeologists and AAL student employees. Principal Investigators were AAL Archaeologists Christine Thompson and Kevin C. Nolan. The field survey was conducted between July 23, 2015 and October 3, 2015. The field survey was executed using pedestrian transects spaced at 10 meter intervals. The survey interval was reduced to 5 meters when artifacts were encountered. The areas surveyed by pedestrian transects had between 60 to 90 percent ground surface visibility. All artifacts that were within two meters of the first artifact encountered, except fire-cracked rock and brick, were collected, bagged and given a temporary transect and find numbers. Objects found farther than that within the same transect were given the same transect number and the next sequence number. If a site only consisted of one collection point, a 10 x 10 meter radial survey was conducted around the point. Each new radial find was assigned a new find number. If multiple artifacts were encountered along multiple transects, short transects were run at five meter intervals to refine the boundaries of the cluster. Fire-cracked rocks and bricks were counted in the field, but were

not collected. Find points were mapped with a Trimble GeoXT Series GPS with a minimum of 20 readings logged for each find spot. GPS data was post-processed to sub-meter accuracy using Trimble GPS Pathfinder Office series 5.3 software and exported to ESRI shapefile formats (UTM NAD83 Zone 16N) for inclusion in the project GIS. Field notes were maintained by AAL field supervisors.

Laboratory

All collected artifacts were taken to the AAL laboratory for processing, identification, analysis and temporary curation. Artifacts were cleaned, classified and catalogued. Definitions used for classifying prehistoric lithic materials are included in Volume 2, Appendix B. Diagnostic point types were classified and dated using standardized reference materials (Justice 2006). Metric attributes and raw material identifications were recorded in accordance with AAL standards (Volume 2, Appendix C). Lithic raw materials were identified by comparison with reference samples and published descriptions on file in the AAL laboratory (Cantin 2008; DeRegnaucourt and Geogiady 1998; Stelle and Duggan 2003). Their association was reported to geologic period, with the chert typology being reported as the type most consistent with the specimen. All prehistoric artifact and chert identifications were made microscopically at 10x or greater. Historic artifacts were identified and dated using published references (Horn 2005; IMACS 1984, 1992, 2009; Lofstrom et al. 1982; Majewski and O'Brien 1987; Miller 2000; Nelson 1964; ODOT 1991; Standler 2006; Stelle 2001). Notes, maps and photographs were reviewed and prepared for illustration and curation. State site numbers were obtained and a DHPA Sites and Structures Inventory form was entered in SHAARD for each site identified during the project.

BSU AAL Standard Lithic Identification Method

By Kevin C. Nolan, Mark A. Hill, and Colin L. Macleod

Chippable stone raw materials were identified in comparison with the AAL chert collections. All artifacts are compared macroscopically and microscopically with samples of known provenience from the AAL comparative chert collection. The comparative collection contains hundreds of samples of all of the known varieties of Indiana chert and several cherts from neighboring states. This provides an invaluable perspective on the variability within each defined category. Our method of raw material identification involves several steps.

The initial step involves the visual sorting of materials into groups based on broad categories of raw materials such as sedimentary rocks, igneous rocks, cherts, quartzites, orthoquartzites, chalcedonies, obsidian, and other metamorphic, sedimentary, and igneous categories (Kooyman 2000:37). As most of the raw materials in the Midwest consist of marine cherts, the next steps are often the key to material identification. Each artifact is macroscopically identified with probable match categories using hand samples and reference

manuals (e.g., Cantin 2008) at this stage. Attention is paid to luster, color, patterning, inclusions, translucency, and texture. Next, several samples from the probable match categories are collected and examined under magnification with a 57900-04 Boreal Zoom Stereo Microscope at 10x to 40x magnification. We microscopically compare matrix, color, texture, inclusions, luster, and other physical and visual characteristics of the unknown artifact to the known comparative collection samples from the probable match categories and Cantin's (2008, 2011) resources. This step is crucial in obtaining the most accurate identification possible as Cantin (2011:Slide 10) notes that "Macroscopic identification is sketchy at best… microscopic identification … is far more reliable." Further, Cantin (2008:2) notes that what he terms "microfabric" is perhaps the best way to differentiate chert types and varieties. Microfabric is a result of the genesis of the raw material including the process by which the rock was formed (metamorphic, igneous, sedimentary) and in particular, with the marine cherts of the Midwest, the source of silica, the environment in which the silica is precipitated, and the matrix within which this silica is deposited (Andrefsky 2005). Microfabric may include evidence of bedding, fossils present in the environment at the time of formation, or structures such as oolites, silicified worm burrows, and crystalline growths. As fossils and other structures will vary with the conditions and time in which these cryptocrystalline silicates were formed, they are often good visual indicators of raw material source.

The propensity for micro/cryptocrystalline silicates to be strongly influenced by formational and diagenetic processes indicates that identifications of chert material are most appropriately an assessment of the geological age of the material (Luedtke 1992). For this reason specimens are identified to geologic age (period) which is, in turn, consistent with specific geologic formations. Next, the more specific material "type", as described in the reference collection and Cantin (2008), is noted based on the consistency of the material with listed sources. The inconsistent nature, and often heterogeneous representation of many of the identifying features of micro- and cryptocrystalline silicates means that any one of these features is not enough to make a confident material association. A combination must therefore be employed in order to mount evidence for the association of the material with a particular type, and by extension, source. This combination, particularly in small or anomalous samples can lead to association with multiple sources. This is particularly true of materials that share the same age and geographic location as they will have likely undergone comparable formational and diagenetic processes. Where the sample resembles multiple sources in our collection, such is noted. Our identifications to "type" are illustrative of method and not an indication of source.

Finally, we revisit Cantin's (2008:9) map of the known provenience of Indiana chert types to identify the most proximate sources (aside from the nearly ubiquitous gravel chert). Samples from the proximate source(s) are selected and compared microscopically to the unknown artifact. This final step is employed to ensure that we are able to rule out a proximate source from our identification. If the local variety cannot be ruled out, identification will favor the proximate source as most probable. However, location cannot be a primary criterion when

attempting to identify the raw material of an artifact. Identifications are based on the best overall match of observed macroscopic and microscopic characteristics between known and unknown samples. If a clear match cannot be made, the material is categorized as unidentified.

Rocks of the same age and of the same or comparable formation may, and often do, have distributions outside of Indiana and can find their way into Indiana from these extra-locational sources. This occurs through glaciations, human mobility, or trade as a result of contact. For this reason Cantin's (2008) work, while effective at identifying the known locations of primary chert sources in Indiana, cannot alone account for the diversity of materials found archaeologically in Indiana. Cantin's information on chert is therefore supplemented with sources from surrounding states such as Illinois, Michigan, Ohio, and Kentucky (DeRegnaucourt and Geogiady 1998; Stelle and Duggan 2003) which stand to have the greatest extra-local influence on lithic material types found in Indiana.

There is always the possibility of misclassification with visual identification; however, our procedures are the same for all projects, and replicable across projects that employ the same procedures. Inter-observer variability is unavoidable in the absence of discrete criteria for identification of unknowns with ideal categories. Our procedures attempt to limit the magnitude of these errors. Finally, it must be said that identifications made by these and similar procedures are provisional, and cannot definitively match an unknown to a known geological provenience. For more definitive results, geochemical methods such as Instrumental Neutron Activation Analysis, X-ray Florescence, or other methods are required (Andrefsky 2005; Kooyman 2000). However, using the criteria and procedures detailed above, our identifications (and all visual identifications) should be taken as an assessment of the geological age and context of the raw material. Rocks of the same age and context have known distributions outside of Indiana and may well find their way into Indiana from another deposit of the same geological formation through natural or cultural processes. Our identifications do not presume mechanism of transport.

All materials generated by this project were accessioned under AAL Accession number 15.35. All project materials were curated at Ball State University, Department of Anthropology. Landowners were given their choice of having the artifacts returned to them or having the artifacts curated at Ball State University (see Volume 2, Appendix D for listing). All artifacts returned to the landowners were identified, analyzed, measured, and photographed per DHPA guidelines. A DVD of these artifact photos is attached to this report. The DVD with the artifact photos also contains the catalog sheets for all sites and Volume 2 of the report. All artifacts not requested to be returned to the landowner were catalogued, labeled and curated at Ball State University's Applied Anthropology Laboratories and will be used for student education and research.

Archaeological Survey Results

A total of twelve survey areas were investigated as part of this grant project (Figure 21).

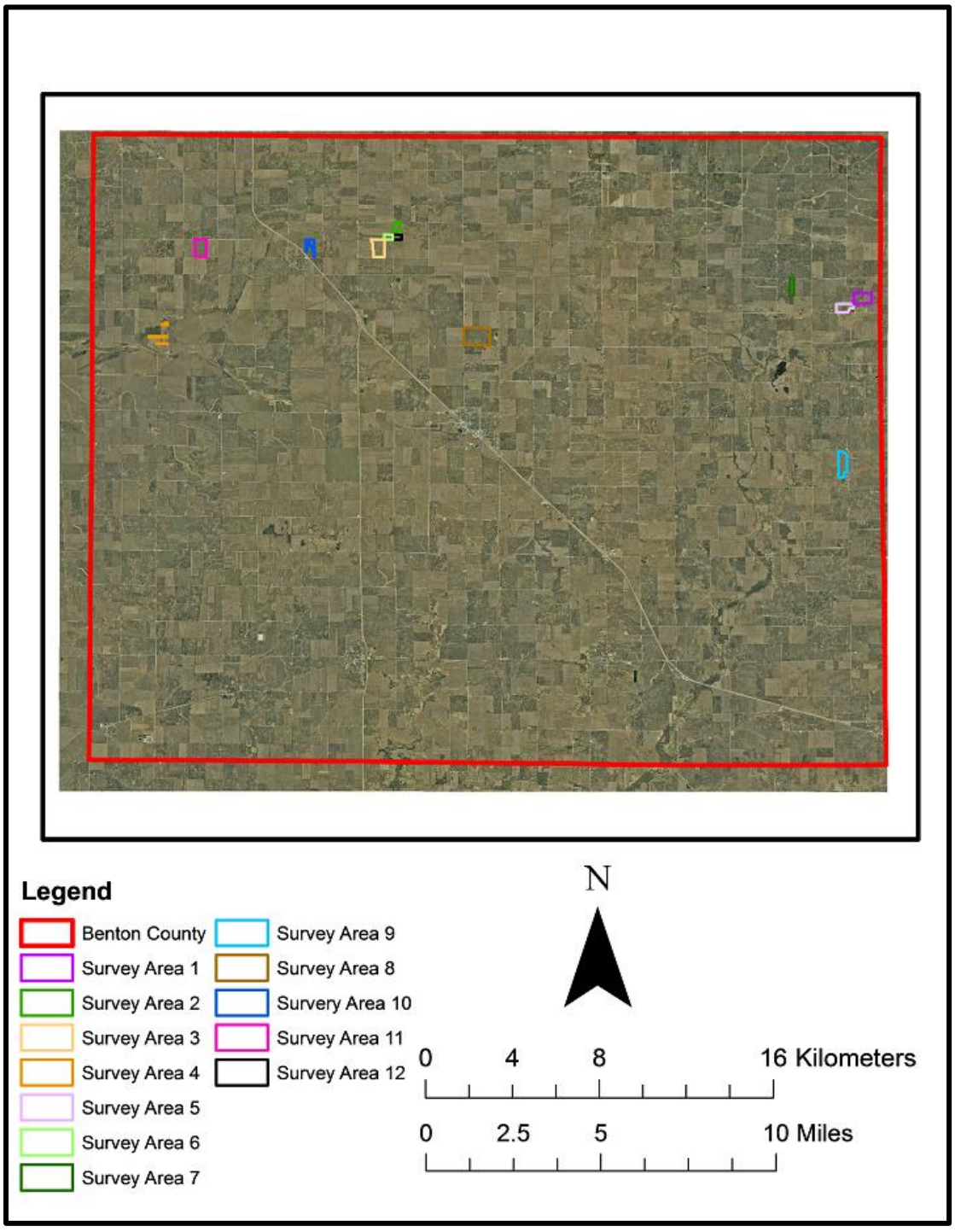

Figure 21: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of the 12 survey areas within Benton County.

Survey Area 1

Survey Area 1 was located in Gilboa Township in [redacted] Township 26 North, Range 6 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Templeton NE, Indiana Quadrangle (Figure 22 and Figure 23). The property was surveyed on July 23, 2015. Ground surface visibility was approximately 60-90 percent with some weeds and corn stalks themselves hindering visibility. The field was planted in corn, standing between two and four feet tall. Due to the high amounts of rainfall this year, there were weeds standing between 6 and 12 inches, ponding in the center of the field, and fairly large patches of little to no corn growth. Approximately 92.34 acres were surveyed consisting of ground moraines and end moraines. The area contained Chalmers (Ch), Corwin (CsA), Darroch (Dp), Gilboa (GlA and GlB), Montomorenci (MxB2), Odell (OIB2), Peotone (Ph), Selma (Sh), Wolcott (Wt) soils. Ten sites (12-Bn-102 to 12-Bn-111) were encountered during the survey. The sites ranged in size from prehistoric and historic isolated finds to a historic scatter of 2,058.02 square meters (0.51 acres).

[redacted]

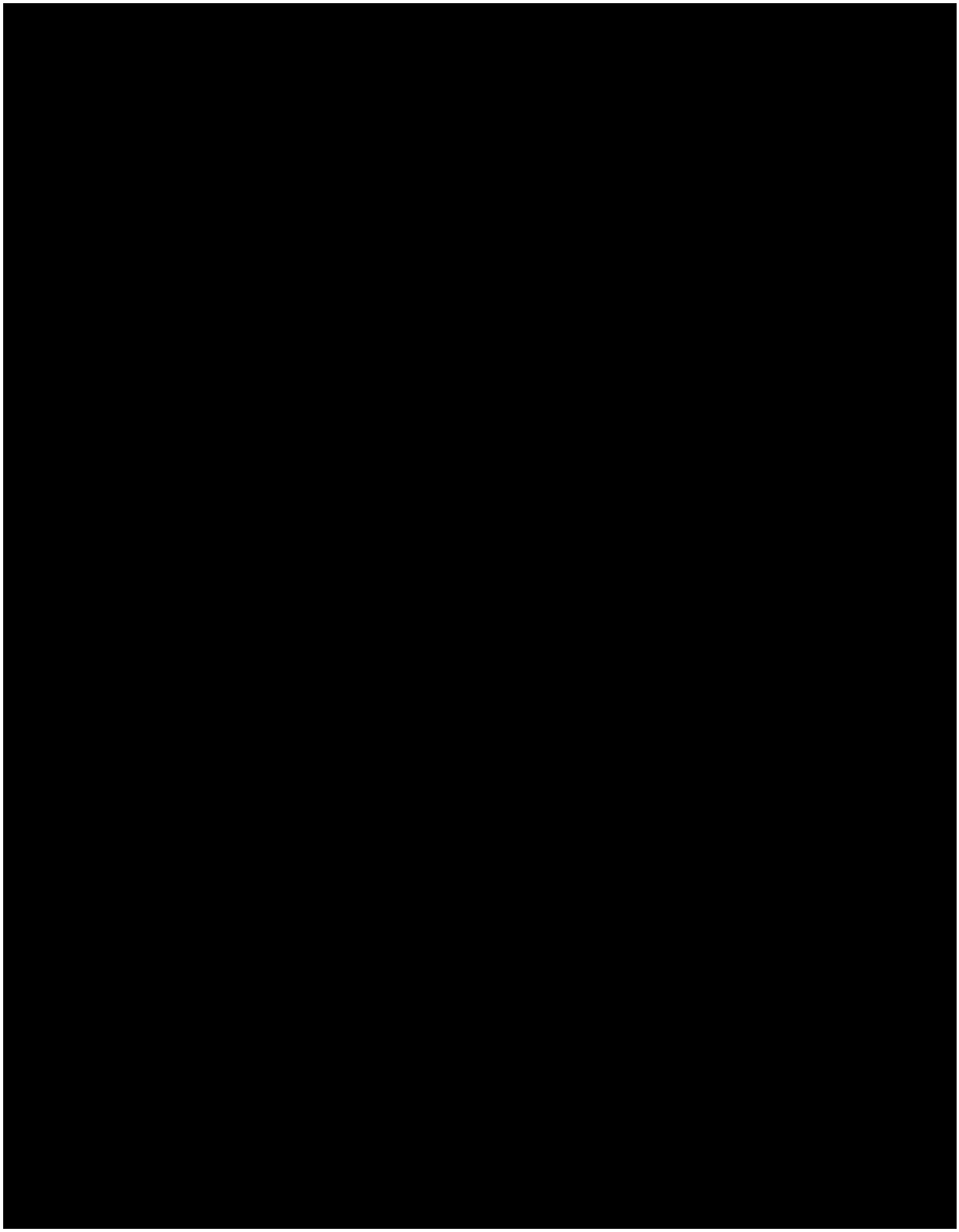

Figure 22: A portion of the map of Gilboa Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 1.

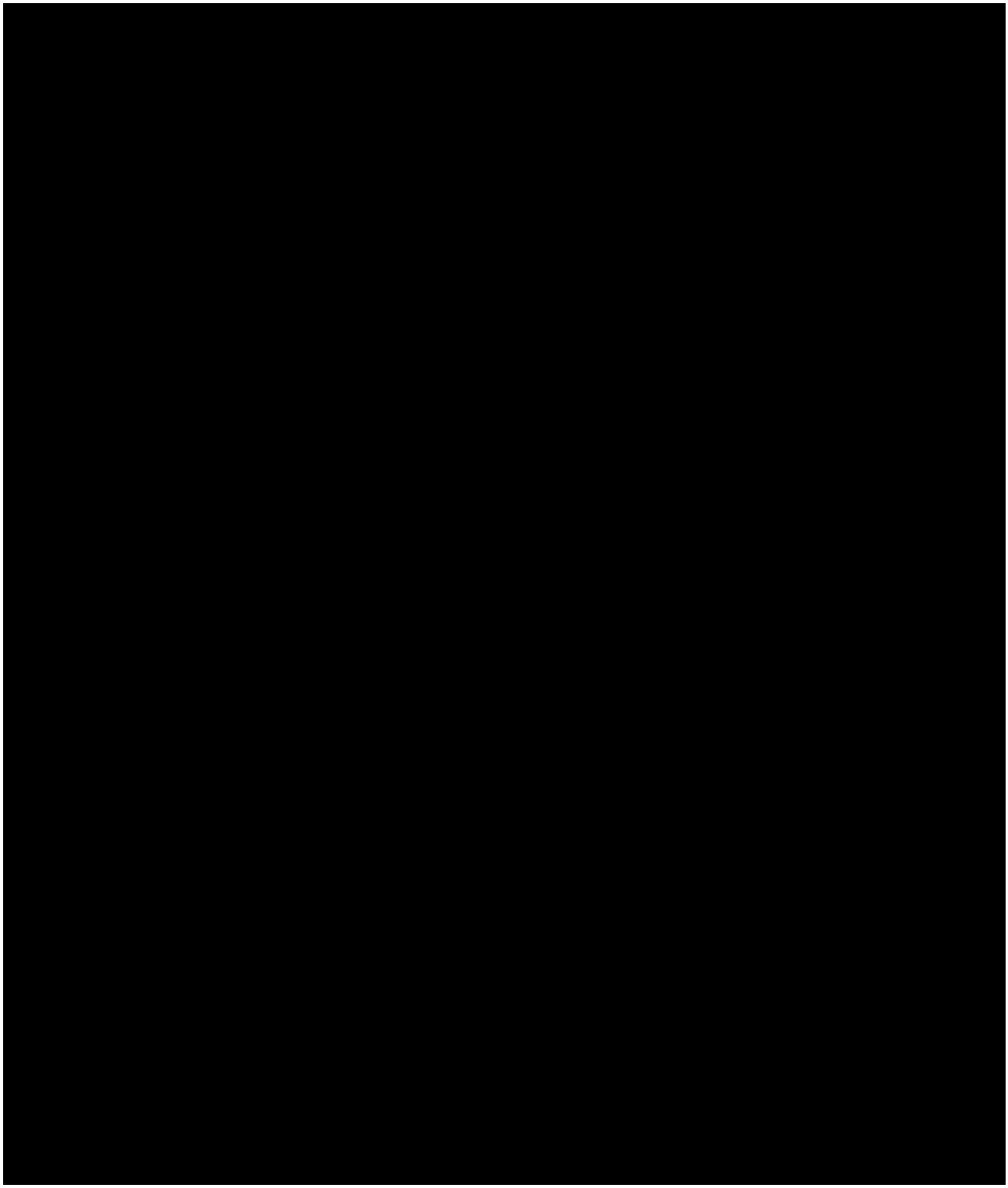

Figure 23: A portion of the USGS 7.5' Templeton NE, Indiana Quadrangle showing the location of Survey Area 1.

Figure 24: Field Picture of [redacted] at Survey Area 1, Gilboa Township, Benton County (photo by Christine Thompson, Ball State University).

Artifacts

A total of 81 artifacts were encountered in Survey Area 1. Table 6 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 25 to Figure 28. Artifacts are listed by individual site in Volume 2, Appendix E.

Seven prehistoric artifacts were recovered from sites 12-Bn-102, 12-Bn-103, 12-Bn-104, and 12-Bn-105. No diagnostic prehistoric artifacts were recovered from Survey Area 1.

Seventy-four historic artifacts were recovered from Survey Area 1 and of those, 69 artifacts are diagnostic (Table 6). Chronologically expressed these items include aqua glass recovered from site 12-Bn-107 which was manufactured between 1800 to the 1920s (Horn 2005:1). Black transferprint whiteware recovered from site 12-Bn-107 was manufactured from 1820 to 1860

(Stelle 2001:Chapter I). Plain whiteware recovered from site 12-Bn-107 was manufactured from 1820 to present (Stelle 2001:Chapter I). Yellowware recovered from site 12-Bn-107 was manufactured between 1830 to present (ODOT 1991:77). Stoneware with Albany glaze interior and a Bristol glaze exterior recovered from site 12-Bn-107 was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Stoneware with Bristol glaze interior and exterior recovered from site 12-Bn-107 was manufactured between 1835 to present (Stelle 2001:Chapter I). Plain ironstone recovered from site 12-Bn-107 was manufactured between 1842 to 1930 (Miller 2000; Stelle 2001:Chapter I). Amber glass recovered from site 12-Bn-107 was manufactured between the 1860s to present (Horn 2005:1). Clear glass recovered from site 12-Bn-107 was manufactured between 1875 to present (IMACS 1992:473). Stoneware with painted cobalt decoration recovered from site 12-Bn-107 was manufactured from 1880 to 1940 (Stelle 2001:Chapter 1). Milk glass recovered from site 12-Bn-110 was manufactured between the 1890s to present (Horn 2005:1). Stoneware with Albany glaze interior and exterior recovered from site 12-Bn-107 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and salt glaze exterior recovered from site 12-Bn-107 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I).

Table 6: Artifacts from Survey Area 1.

Prehistoric	No.	Historic	No.
Biface	1	Ceramic, Ironstone	6
Flake, Medial	2	Ceramic, Whiteware	7
Flake, Modified	1	Ceramic, Yelloware	2
Flake, Shatter	1	Ceramic, Stoneware	22
Flake	2	Glass, Amber	1
		Glass, Amethyst	2
		Glass, Aqua	12
		Glass, Clear	12
		Glass, Milk	1
		Iron	6
		Brass Button	1
		Charcoal	2
Total	**7**	**Total**	**74**

Table 7: Historic Diagnostics from Survey Area 1.

Artifact Type	Site	Date Range	Citation
Aqua Glass	12-Bn-107	1800-1920s	Horn 2005:1
Black transferprint whiteware	12-Bn-107	1820-1860	Stelle 2001:Chapter I
Plain whiteware	12-Bn-107	1820-present	Stelle 2001:Chapter I
Yellowware	12-Bn-107	1830-present	ODOT 1991:77
Stoneware with Albany glaze interior and Bristol glaze exterior	12-Bn-107	1830-1940	Stelle 2001:Chapter I
Stoneware with Bristol glaze interior and exterior	12-Bn-107	1835-present	Stelle 2001:Chapter I
Plain ironstone	12-Bn-107	1842-1930	Miller 2000; Stelle 2001:Chapter I
Amber glass	12-Bn-107	1860s-present	Horn 2005:1
Clear glass	12-Bn-107	1875-present	IMACS 1992:473
Stoneware with painted cobalt decoration	12-Bn-107	1880-1940	Stelle 2001:Chapter I
Milk glass	12-Bn-110	1890s-present	Horn 2005:1
Stoneware with Albany glaze interior and exterior	12-Bn-107	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and salt glaze exterior	12-Bn-107	Termination date of 1940	Stelle 2001:Chapter I

Figure 25: Representative prehistoric artifacts from Survey Area 1 (Photo by Kiya Mullins, Ball State University).

Figure 26: Representative ceramic artifacts from Survey Area 1 (Photo by Kiya Mullins, Ball State University).

Figure 27: Representative glass artifacts from Survey Area 1 (Photo by Kiya Mullins, Ball State University).

Figure 28: Representative iron artifacts from Survey Area 1 (Photo by Kiya Mullins, Ball State University).

Sites

Ten archaeological sites (12-Bn-102 to 12-Bn-111) were recorded in Survey Area 1 (Figure 29 and Figure 30). Summaries for the individual sites are contained in Volume 2, Appendix F. Four sites (12-Bn-102, 12-Bn-107, 12-Bn-110, and 12-Bn-111) had diagnostic artifacts. Six of the sites were prehistoric isolated finds (12-Bn-103, 12-Bn-104, 12-Bn-105, 12-Bn-106, 12-Bn-108, and 12-Bn-109). One site was a historic scatter (12-Bn-107) and two sites were historic isolated finds (12-Bn-110 and 12-Bn-111). One site was a multicomponent site (12-Bn-102) with a historic scatter and prehistoric isolate.

All ten sites were discovered in end moraines and ground moraines. One site (12-Bn-103) was found on Selma silty clay loam (Sh) soil, two sites (12-Bn-110 and 12-Bn-111) were found on Gilboa silt loam (GlB) soil, one site (12-Bn-105) was found on Chalmers silty clay loam (Ch), two sites (12-Bn-107, 12-Bn-108) were in Darroch silt loam (Dp), and three sites (12-Bn-102, 12-Bn-106, and 12-Bn-109) were found in Montmorenci silt loam (MxB2) soils. One site (12-Bn-104) was found on Gilboa silt loam (GlB) and Montmorenci silt loam (MxB2) soils.

Site 12-Bn-107 was a medium sized historic scatter, comparatively larger than the other sites in Survey Area 1. No sub-surface features or evidence of historic structures were encountered in 12-Bn-107. Three historic maps (Andreas 1968 Geo. A. Ogle & Co 1909; Taylor 2009:37) were consulted to assess potential for intact historic deposits. While historic maps failed to reveal any structures within or near the scatter, historic maps do show the relative proximity to [redacted] or [redacted] (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:37). [redacted] With no structural remnants or subsurface features encountered, it is possible that 12-Bn-107 was a historic dump site, rather than a primary deposit, for [redacted] The tight clustering of the artifacts suggests that topography played a part in the formation of the site, considering that the site is located on a slope. Artifacts could very possibly have been thrown into the deposit area. The location of site 12-Bn-107 on a slope makes it unlikely that a structure would have been erected where the scatter was located. While 12-Bn-107 does not appear to have been a settlement or structure location, substantial information about the lives of the [redacted] or other early settlers could be contained in this slope midden. Based on the archaeological evidence and our historic research, 12-Bn-107 is potentially eligible under Criteria D.

All other sites in Survey Area 1 are types not typically considered to have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 1 consisted of approximately 92.34 acres of ground moraines and end moraines. Within Survey Area 1, a density of one sites per 9.23 acres occurred and sites covered 2.26 percent of the surface area.

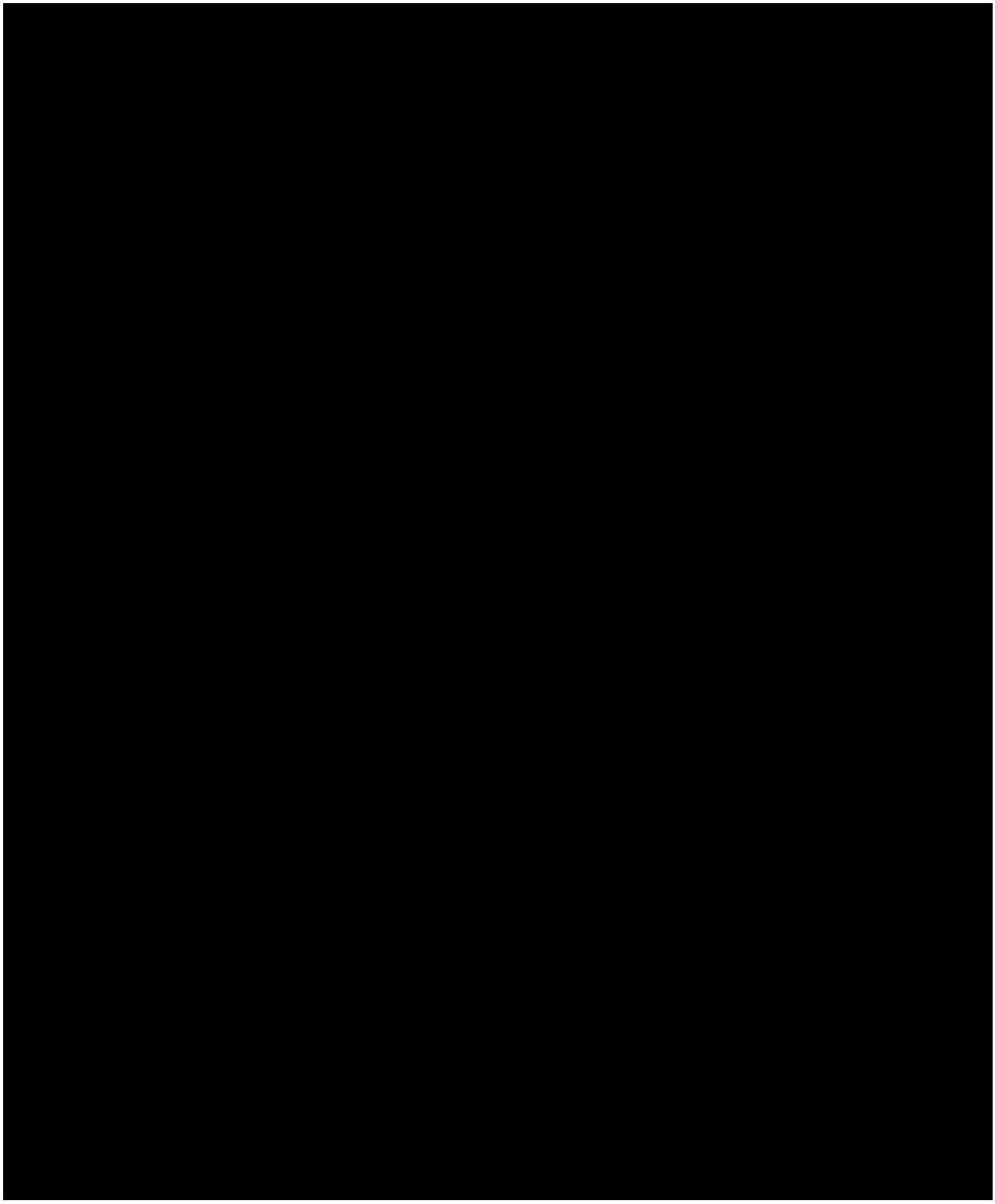

Figure 29: A portion of the USGS 7.5' Templeton NE, Indiana Quadrangles showing the location of sites 12-Bn-102 to 12-Bn-111.

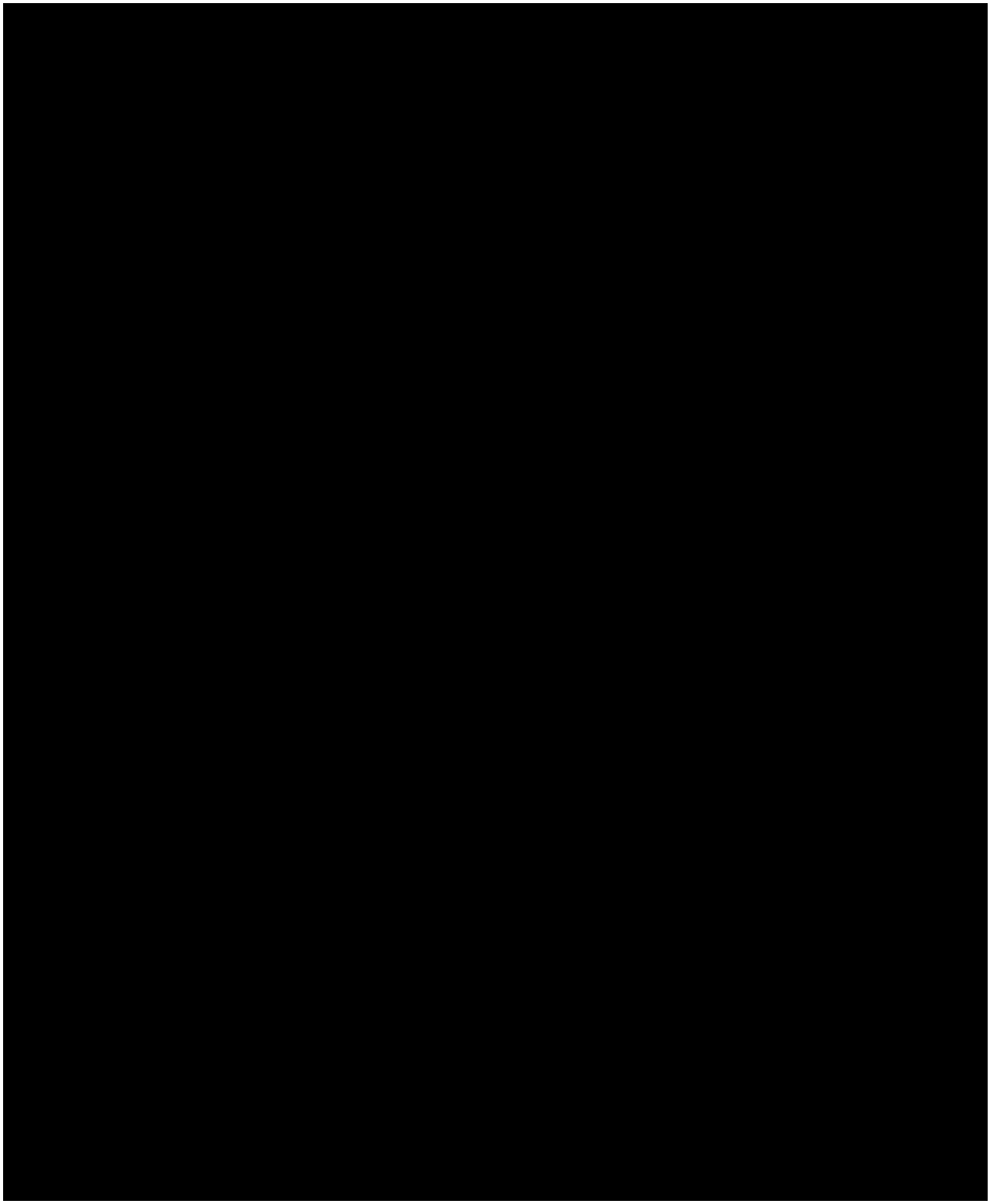

Figure 30: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-102 to 12-Bn-111.

Survey Area 2

Survey Area 2 was located in Richland Township in [redacted] Township 26 North, Range 8 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Wadena, Indiana Quadrangle (Figure 31 and Figure 32). The property was surveyed on July 28, 2015. Ground surface visibility was 80 to 90 percent with weeds located in end rows hindering visibility. The field was still planted in corn, which was approximately seven to 11 feet high. The planting of intersecting and overlapping corn rows made survey very difficult and Survey Area 2 was only a portion of the landowner's parcel. Approximately 30.16 acres were surveyed consisting of end moraines, ground moraines, and flood plains. The area contained Ashkum (As), Comfrey (Ck), Markham (MbB2), and Selma (Sk) soils. Seven sites were encountered during the survey. The sites ranged in size from prehistoric and historic isolated finds to a multicomponent site consisting of a prehistoric isolate and historic isolate of 118.91 square meters (0.24 acres).

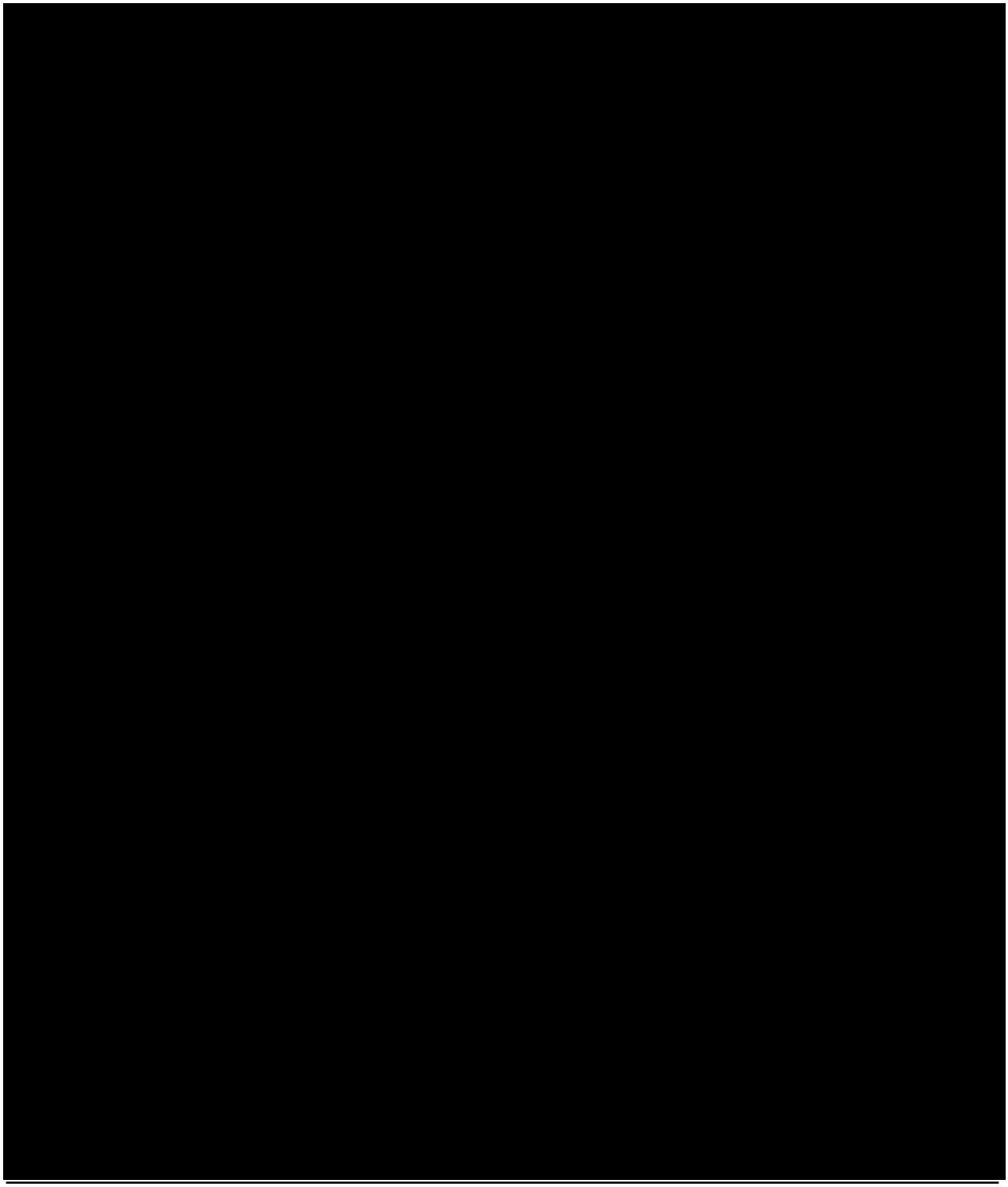

Figure 31: A portion of the map of Richland Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 2.

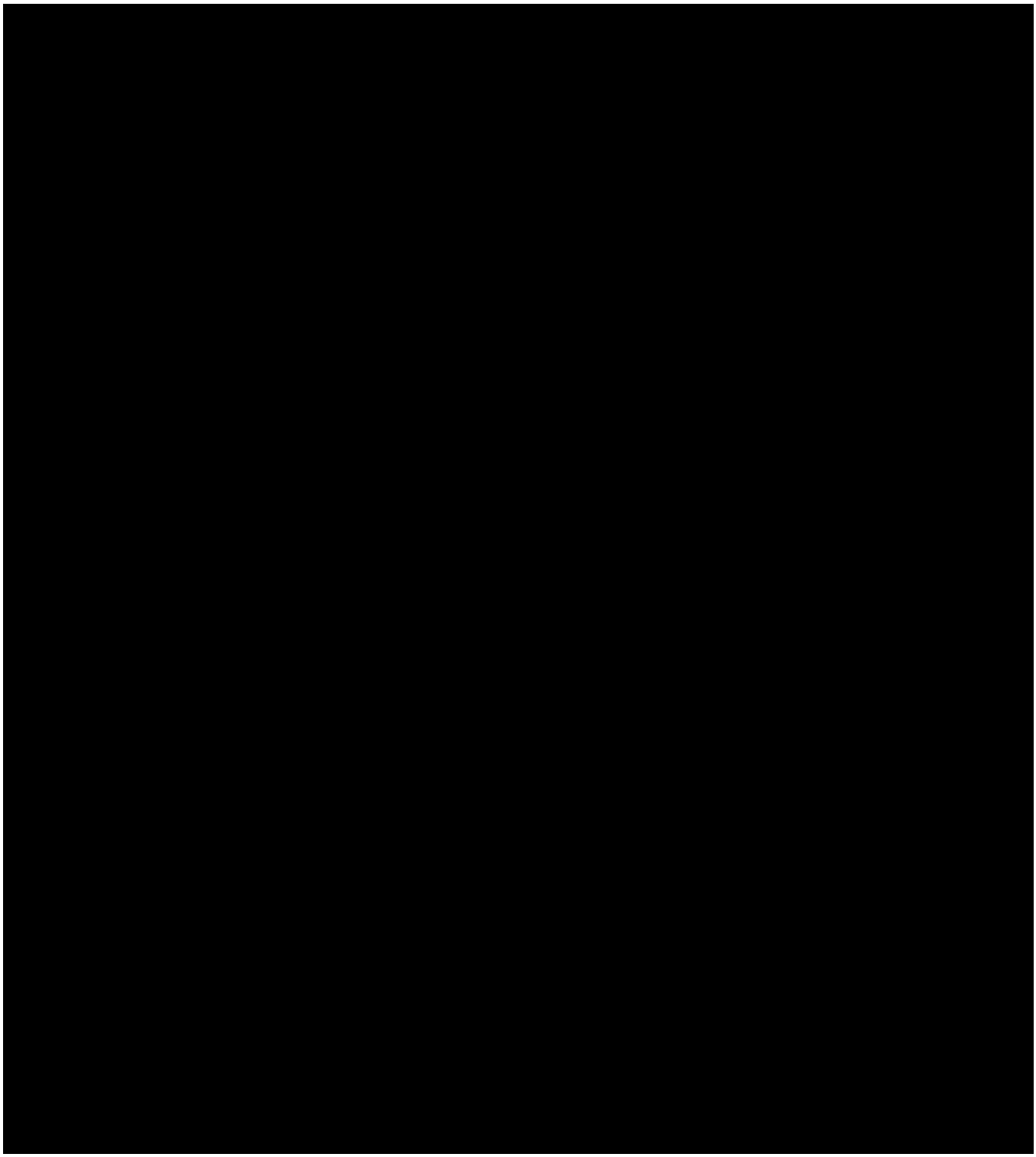

Figure 32: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of Survey Area 2.

Artifacts

A total of eight artifacts were encountered in Survey Area 2. Table 8 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 33 and Figure 34. Artifacts are listed by individual site in Volume 2, Appendix E.

Four prehistoric artifacts were recovered. No diagnostic prehistoric artifacts were recovered from Survey Area 2.

Four historic artifacts were recovered from Survey Area 2 and all four are diagnostic (Table 9). Chronologically expressed these items includes turquoise glass from site 12-Bn-113 which was manufactured between 1800 to the 1920s (Horn 2005:1) and stoneware with Albany glaze interior and exterior recovered from site 12-Bn-118 was manufactured from 1835 to 1940 (Stelle 2001:Chapter I). Stoneware with Bristol glaze interior and exterior recovered from site 12-Bn-116 was manufactured between 1835 to present (Stelle 2001:Chapter I). Plain ironstone recovered from site 12-Bn-115 was manufactured between 1842 to 1930 (Miller 2000; Stelle 2001:Chapter I).

Table 8: Artifacts from Survey Area 2.

Prehistoric	No.	Historic	No.
Flake, Proximal	1	Ceramic Ironstone	1
Flake, Distal	1	Ceramic, Stoneware	2
Flake, Medial	1	Glass, Turquoise	1
Flake	1		
Total	**4**	**Total**	**4**

Table 9: Historic Diagnostics from Survey Area 2.

Artifact Type	Site	Date Range	Citation
Turquoise glass	12-Bn-113	1800-1920s	Horn 2005:1
Stoneware with Albany glaze interior and exterior	12-Bn-118	1835-1940	Stelle 2001:Chapter I
Stoneware with Bristol glaze interior and exterior	12-Bn-116	1835 to present	Stelle 2001:Chapter I
Plain ironstone	12-Bn-115	1842-1930	Miller 2000; Stelle 2001:Chapter I

Figure 33: Representative prehistoric artifacts from Survey Area 2 (Photo by Kiya Mullins, Ball State University).

Figure 34: Representative historic artifacts from Survey Area 2 (Photo by Kiya Mullins, Ball State University).

Sites

Seven archaeological sites, 12-Bn-112 to 12-Bn-118, were recorded in Survey Area 2 (Figure 35 and Figure 36). Summaries for the individual sites are contained in Volume 2, Appendix F. Four sites had diagnostic artifacts (12-Bn-113, 12-Bn-115, 12-Bn-116, and 12-Bn-118). Three of the sites were prehistoric isolated finds (12-Bn-112, 12-Bn-114, and 12-Bn-117). Three sites were historic isolated finds (12-Bn-113, 12-Bn-116, and 12-Bn-118) and one site was a multicomponent site (12-Bn-115) with a prehistoric isolate and historic isolate.

Seven sites (12-Bn-112, 12-Bn-113, 12-Bn-114, 12-Bn-115, 12-Bn-116, and 12-Bn-118) were discovered on end moraines and ground moraines and one site (12-Bn-117) was discovered on flood plains. Four sites (12-Bn-112, 12-Bn-114, 12-Bn-117, and 12-Bn-118) were located on Markham silt loam (MbB2) soils. Two sites (12-Bn-115 and 12-Bn-116) were located on Selma silty clay loam (Sk) soil. One site (12-Bn-113) was located on the boundary of Ashkum silty clay (As) and Markham silt loam (MbB2).

The site types found in Survey Area 2 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National register of Historic Places.

Density

Survey Area 2 consisted of approximately 30.16 acres of end moraines, ground moraines, and flood plains. Within Survey Area 2, a density of one site per 4.31 acres occurred and sites covered 4.18 percent of the surface area.

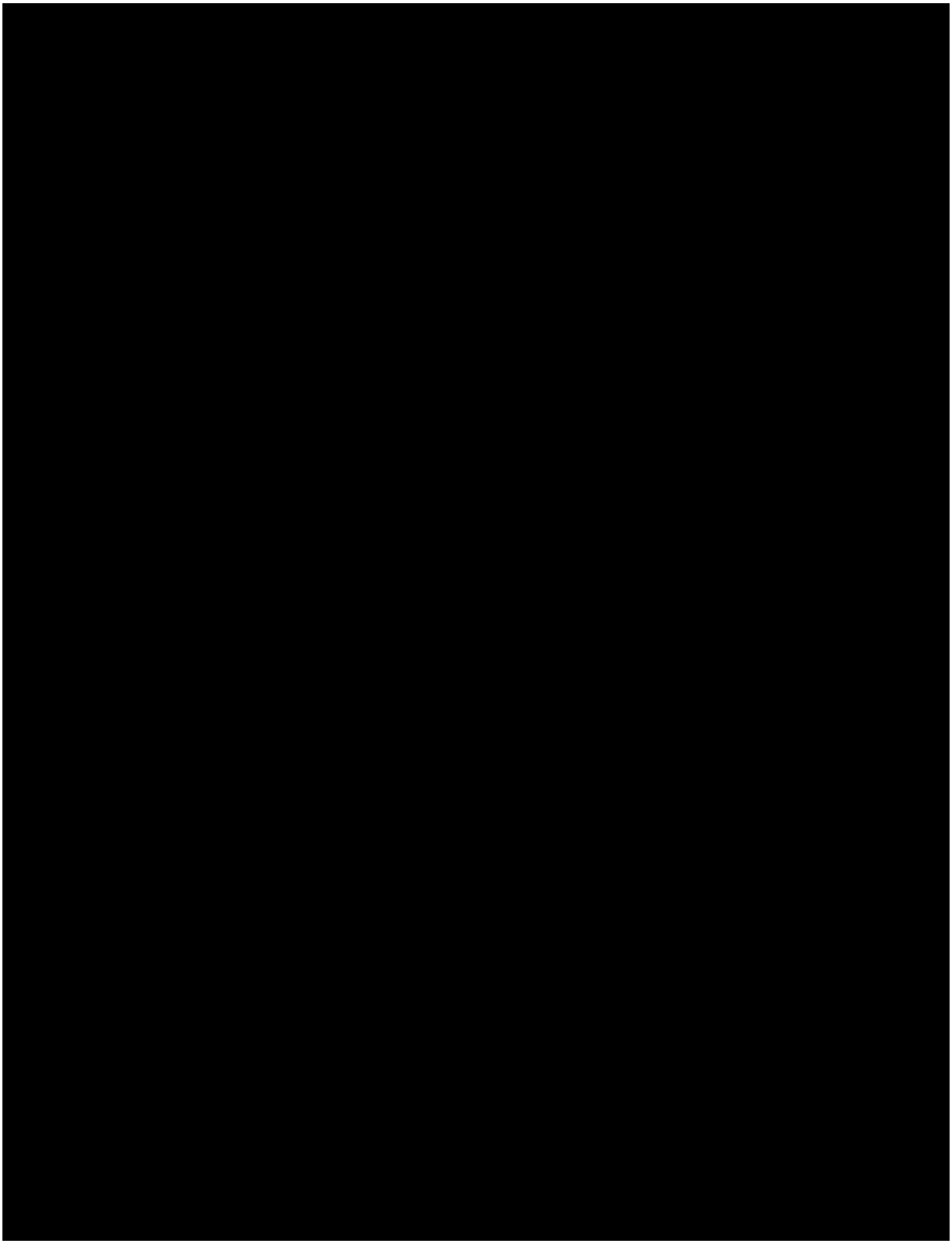

Figure 35: A portion of the USGS 7.5' Richland, Indiana Quadrangle showing the location of sites 12-Bn-112 to 12-Bn-118.

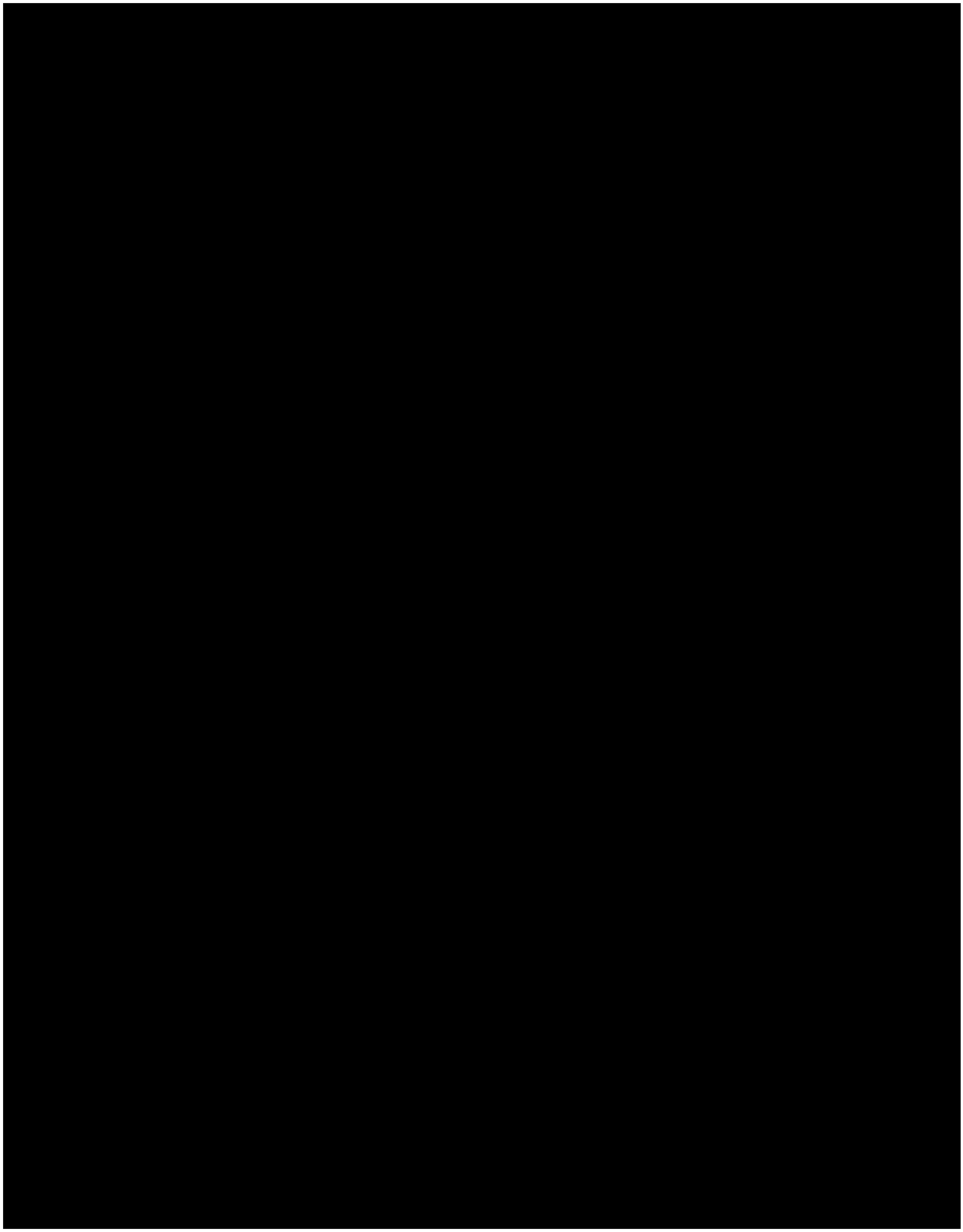

Figure 36: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-112 to 12-Bn-118.

Survey Area 3

Survey Area 3 was located in Richland Township in [redacted], Township 26 North, Range 8 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Wadena, Indiana Quadrangle (Figure 37 and Figure 38). The property was surveyed on August 8, 2015. Ground surface visibility was approximately 80 percent with small amounts of corn debris and the corn stalks themselves being the only visual obstacles. The fields were planted in corn that was still standing, which ranged from five to seven feet tall. Approximately 107.01 acres were surveyed consisting of end moraines. The area contained Barce (BaB2), Chalmers (Ch), Comfrey (Ck), Corwin (CsB2), Crane (Cu), Drummer (Du), Odel (OlD2) soils, Peotone (Pn), and Tippecanoe (TlA) soils. Four sites were encountered during the survey. The sites ranged in size from historic isolated finds to a historic scatter of 687.97 square meters (0.17 acres).

The landowner [redacted] and the farmer [redacted] met the field crew at Survey Area 3 to discuss the project. They gave recommendations on surveying strategy and field access.

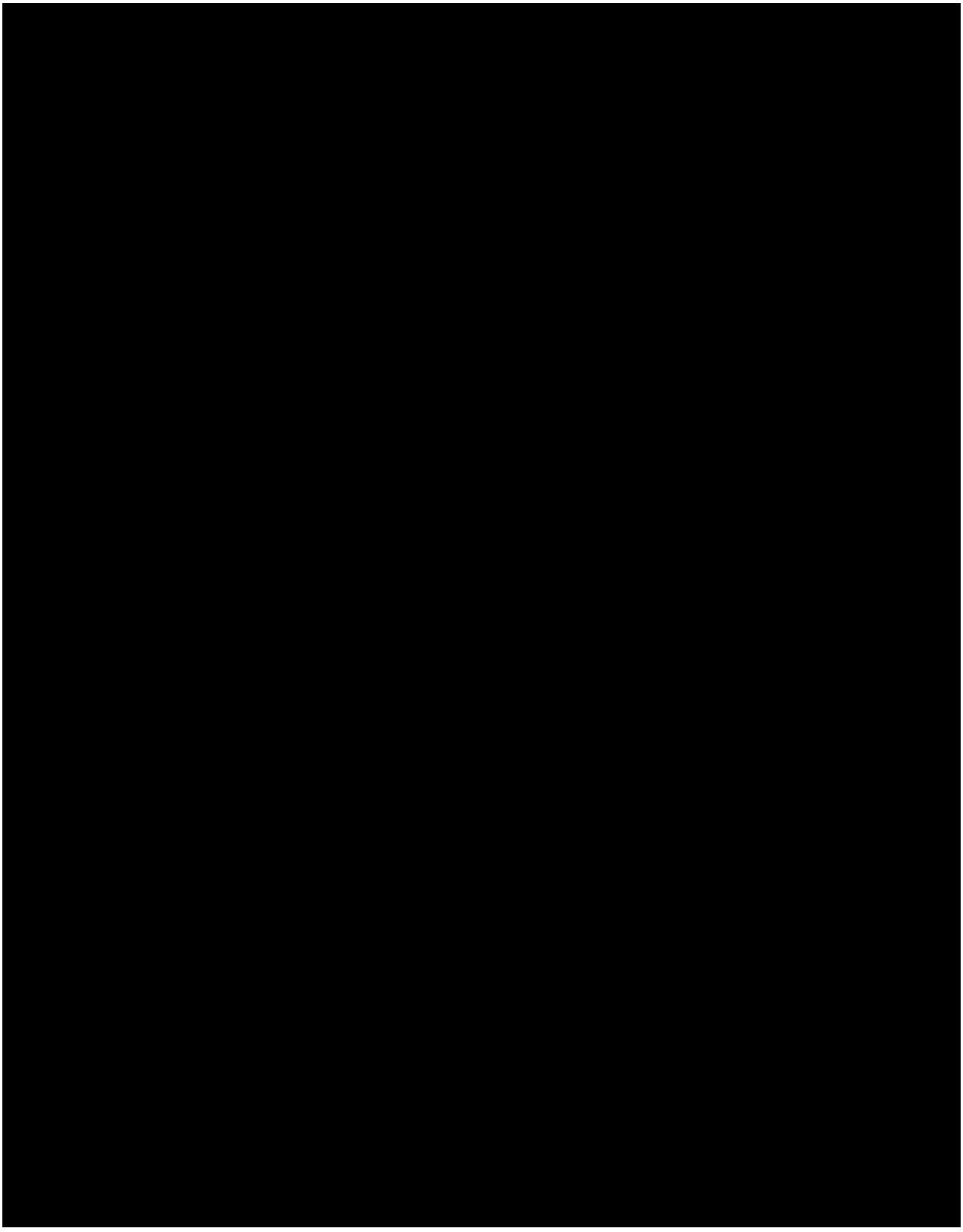

Figure 37: A portion of the map of Richland Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 3.

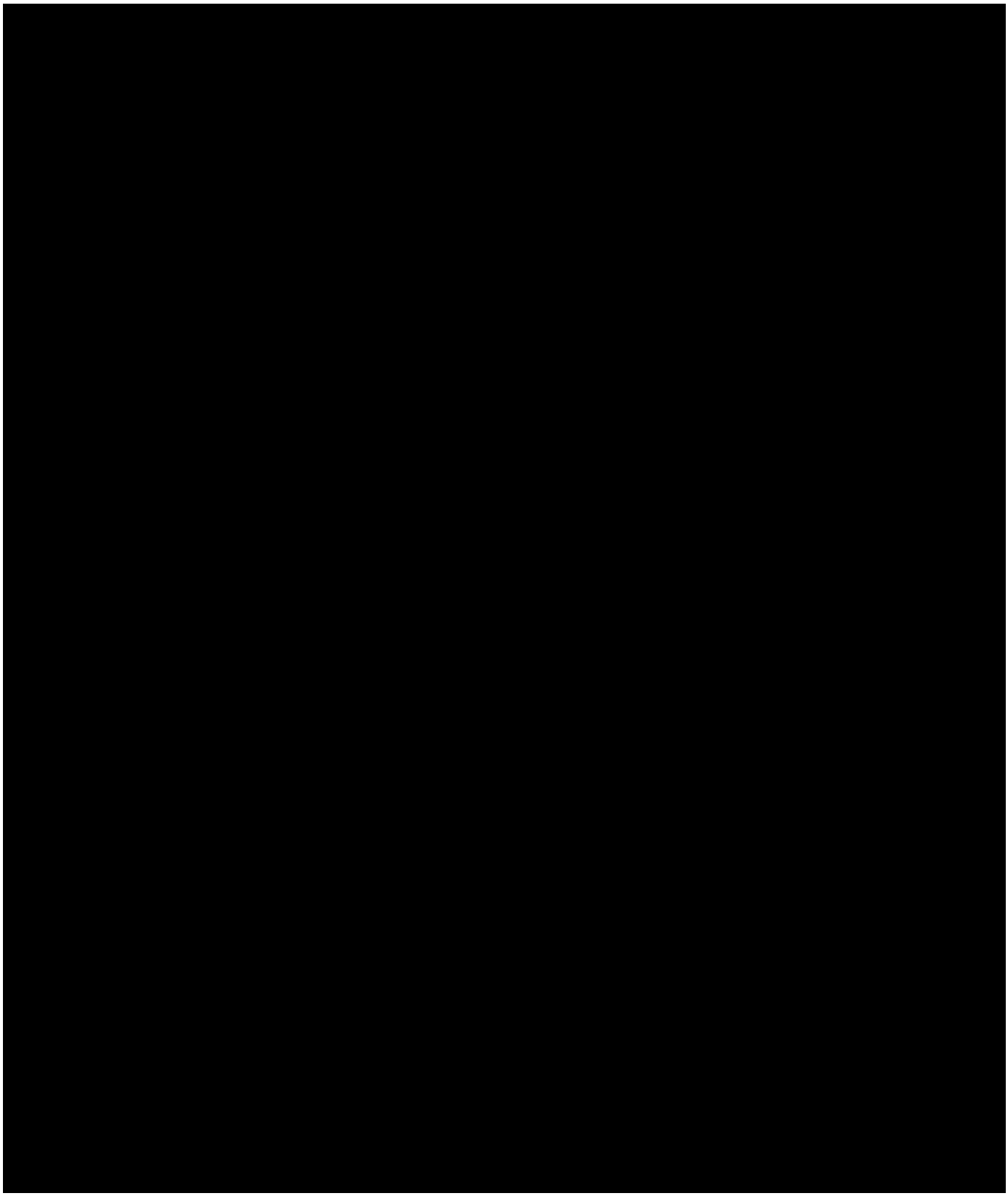

Figure 38: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of Survey Area 3.

Artifacts

A total of five artifacts were encountered in Survey Area 3. Table 10 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 39 and Figure 40. Artifacts are listed by individual site in Volume 2, Appendix E.

No prehistoric artifacts were recovered from Survey Area 3.

Five historic artifacts were recovered from Survey Area 3 and all are diagnostic (Table 11). Chronologically expressed these items include aqua glass recovered from sites 12-Bn-119 and 12-Bn-122 was manufactured between 1800 to the 1920s (Horn 2005:1). Stoneware with a salt glaze interior and exterior recovered from site 12-Bn-120 was manufactured between 1800 to the 1860s (Stelle 2001). Green glass recovered from sites 12-Bn-120 and 12-Bn-121 was manufactured between the 1860s to present (Horn 2005:1).

Table 10: Artifacts from Survey Area 3.

Prehistoric	No.	Historic	No.
		Ceramic, Stoneware	1
		Glass, Aqua	2
		Glass, Green	2
Total	**0**	**Total**	**5**

Table 11: Historic Diagnostics from Survey Area 3.

Artifact Type	Site	Date Range	Citation
Aqua glass	12-Bn-119, 12-Bn-122	1800-1920s	Horn 2005:1
Stoneware with a salt glaze interior and exterior	12-Bn-120	1800-1860s	Stelle 2001
Green glass	12-Bn-120, 12-Bn-121	1860s to present	Horn 2005:1

Figure 39: Stoneware recovered from site 12-Bn-120 (Photo by Kiya Mullins, Ball State University).

Figure 40: Representative glass artifacts recovered from Site 12-Bn-122 (Photo by Kiya Mullins, Ball State University).

Sites

Four archaeological sites, 12-Bn-119 to 12-Bn-122, were recorded in Survey Area 3 (Figure 41 and Figure 42). Summaries for the individual sites are contained in Volume 2, Appendix F. Four sites had diagnostic artifacts (12-Bn-119, 12-Bn-120, 12-Bn-121, and 12-Bn-122). Three sites were historic isolated finds (12-Bn-119, 12-Bn-121, and 12-Bn-122) and one site was a historic scatter (12-Bn-120).

Four sites (12-Bn-119, 12-Bn-120, 12-Bn-121, and 12-Bn-122) were discovered on end moraines. Two sites (12-Bn-119 and 12-Bn-121) were located on Odell silt loam (OlB2) soil and one site (12-Bn-122) was located on Corwin silt loam (CsB2) soil. One site (12-Bn-120) was located on multiple soil types, Corwin silt loam (CsB2) and Barce loam (BaB2) soils.

The site types found in Survey Area 3 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 3 consisted of approximately 107.01 acres of end moraines. Within Survey Area 3, a density of one site per 26.75 acres occurred and sites covered 0.64 percent of the surface area.

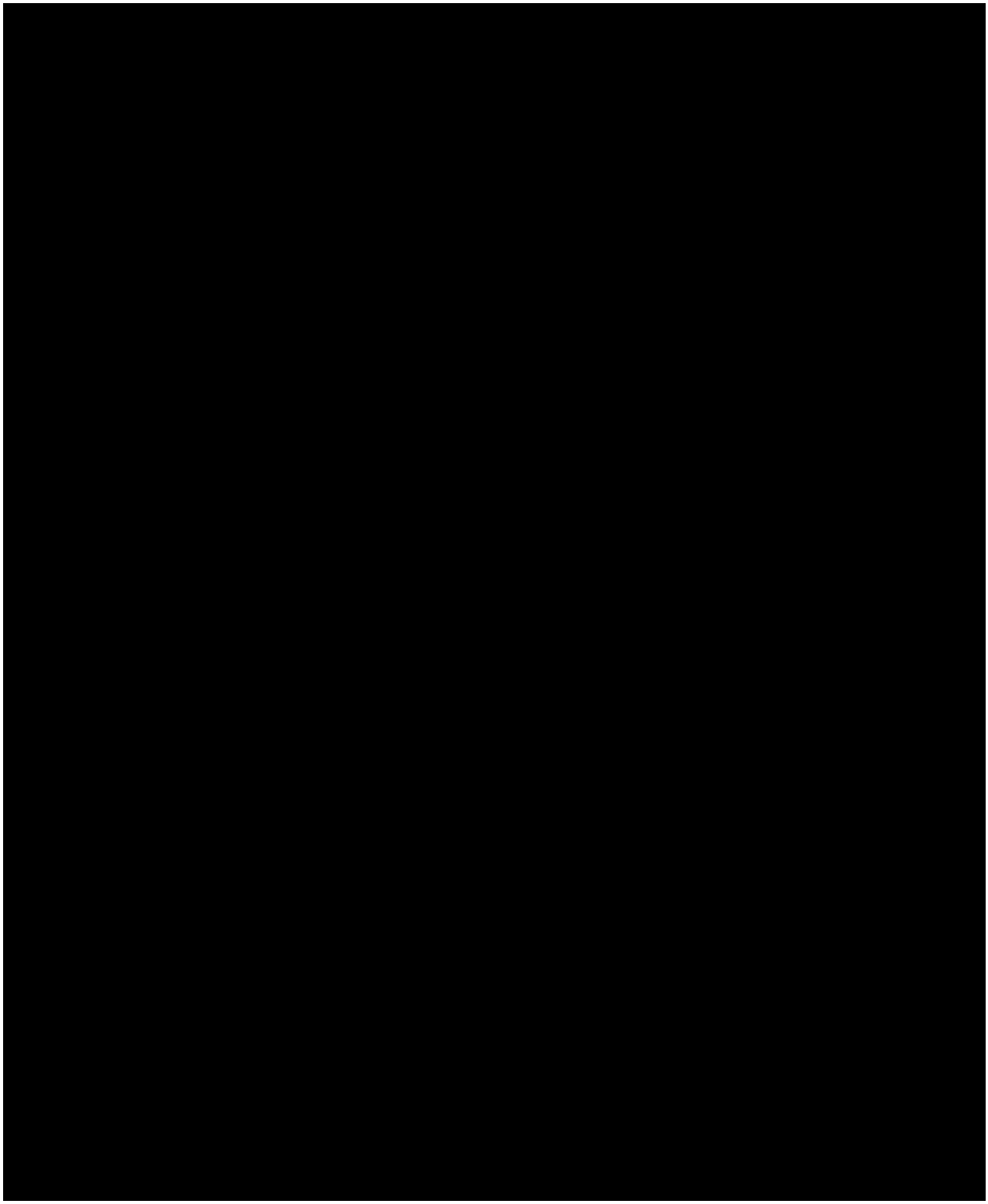

Figure 41: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of sites 12-Bn-119 to 12-Bn-122.

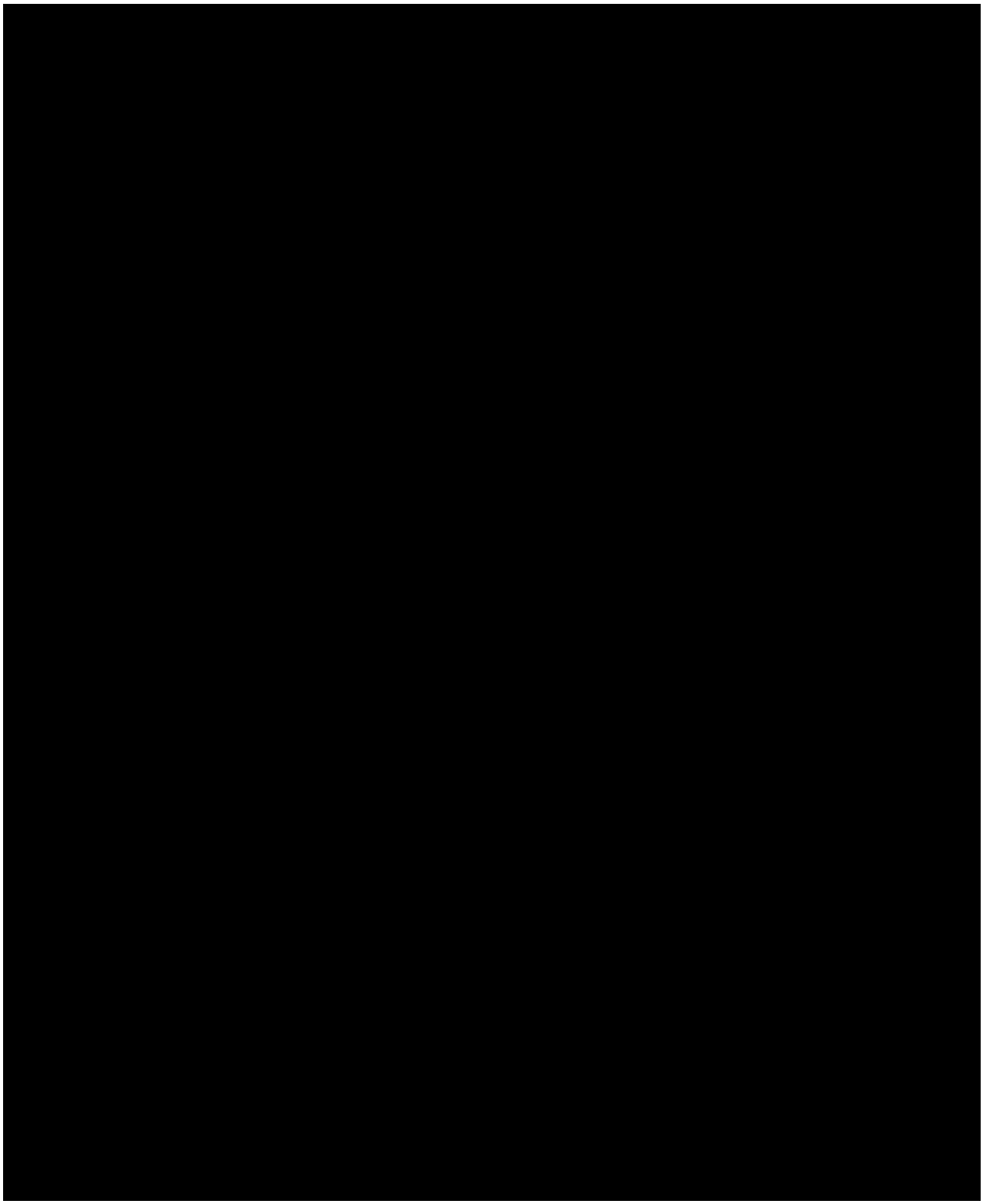

Figure 42: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-119 to 12-Bn-122.

Survey Area 4

Survey Area 4 was located in York Township in [redacted] Township 26 North, Range 9 West and [redacted] Township 26 North, Range 10 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Earl Park Quadrangle (Figure 43 and Figure 44). The property was surveyed on August 4, 2015. The field surveyed was still planted in corn that was standing between seven to 11 feet tall. Ground surface visibility was approximately 70 to 90 percent with small amounts of corn debris, corn stalks, and weeds hindering visibility. Due to the multiple intersection of corn rows when planting, rows were hard to distinguish in the tall corn and survey was very difficult. Due to unsurveyable corn rows, the field crew halted survey and did not survey the entire parcel. Approximately 16.79 acres were surveyed consisting of outwash terraces and outwash plains. The area consisted of Crane (Ct), Free (Ft), Tippecanoe (TlA and TlB), and Wea (WhA and WhB2) soils. The sites ranged in size from a small historic scatter to a 6,642.62 square meter (1.64 acre) historic scatter with a prehistoric isolate.

[redacted]

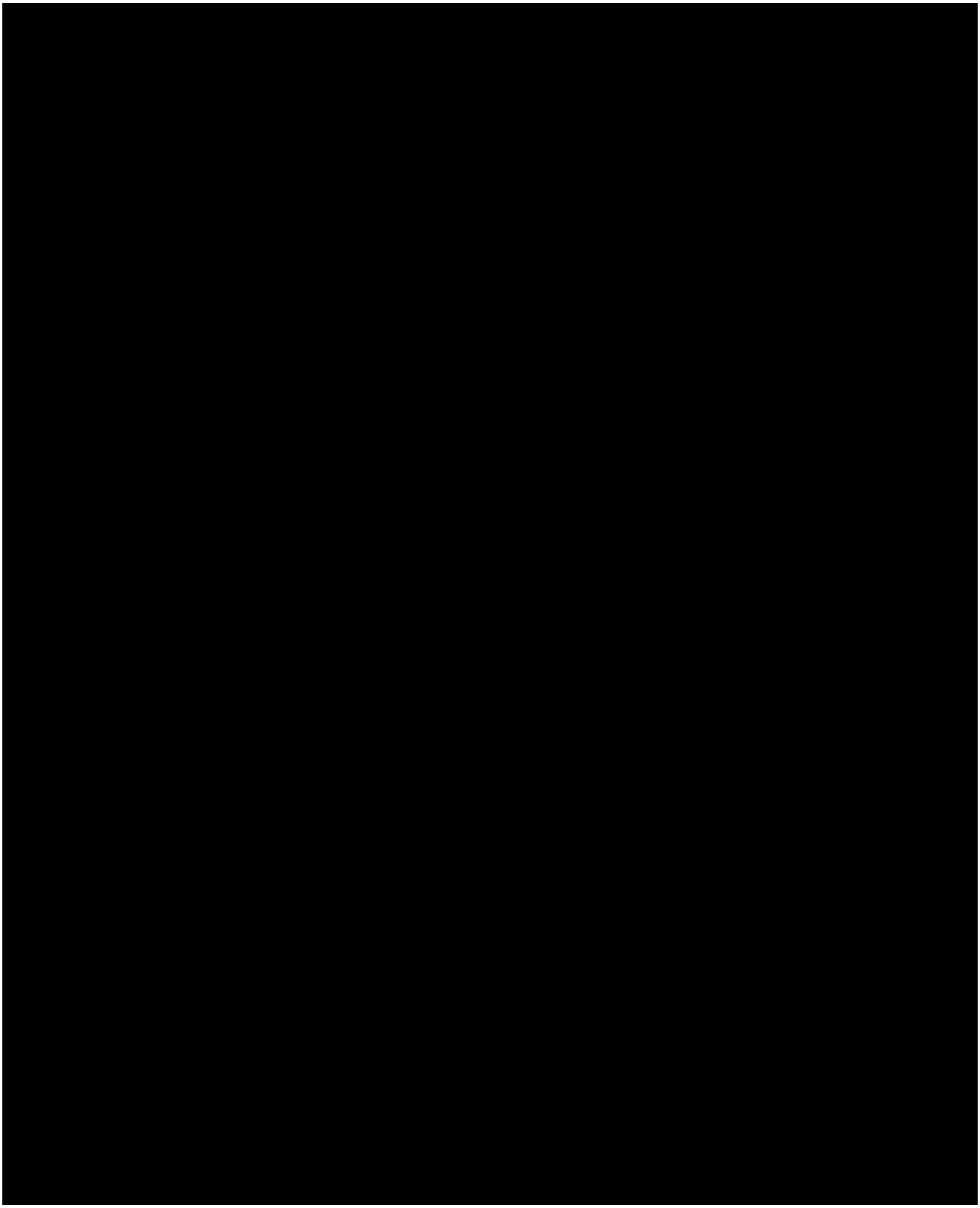

Figure 43: A portion of the map of York Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 4.

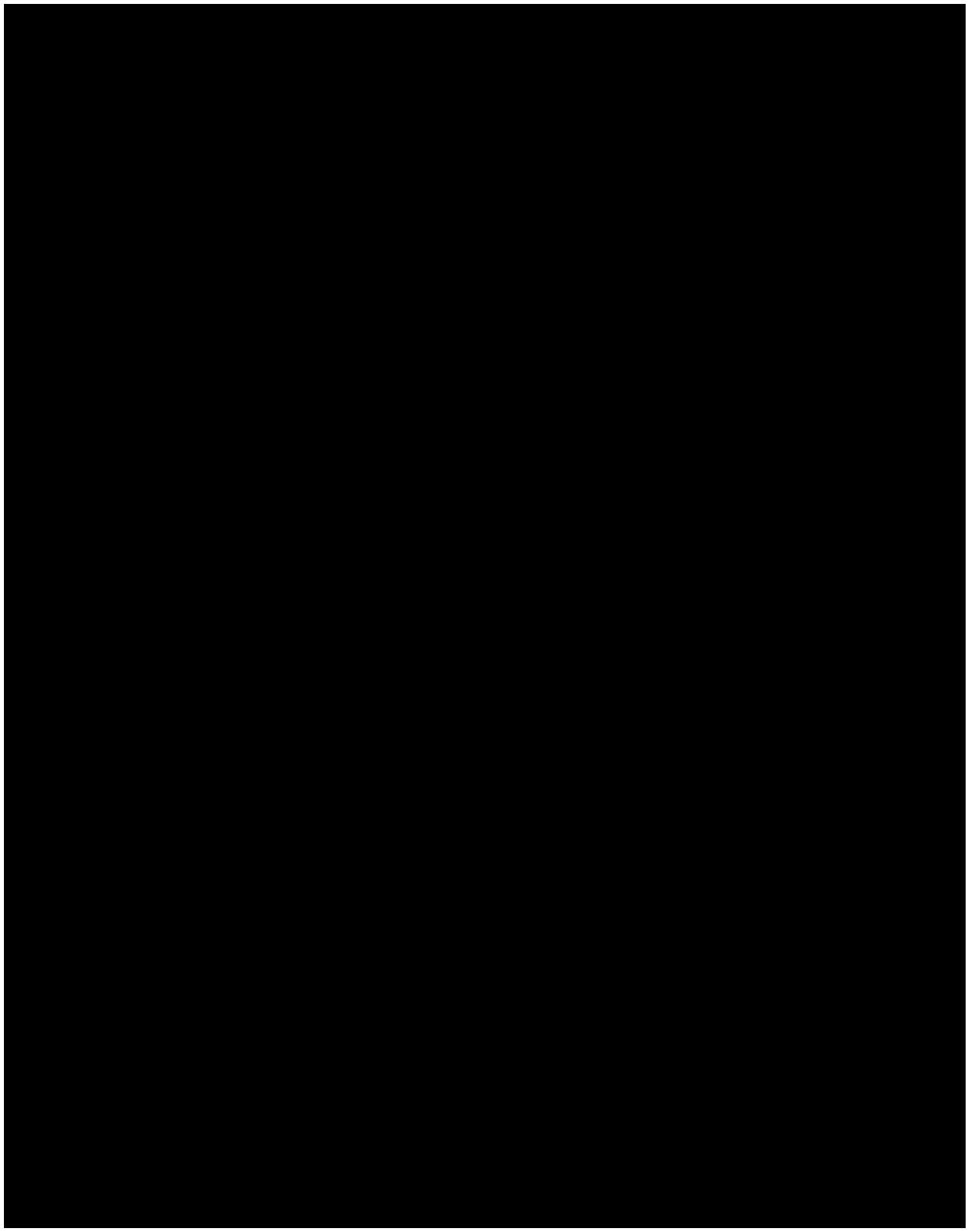

Figure 44: A portion of the USGS 7.5' Earl Park, Indiana Quadrangle showing the location of Survey Area 4.

Artifacts

A total of 10 artifacts were collected in Survey Area 4, with an additional 150 brick fragments observed in the field but not collected. Table 12 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 45 and Figure 46. Artifacts are listed by individual site in Volume 2, Appendix E.

One prehistoric artifact was recovered. No diagnostic artifacts were recovered from the Prehistoric period in Survey Area 4.

Nine historic artifacts, excluding the uncollected 150+ bricks found at the site, were identified in Survey Area 4 and of the nine collected, six are diagnostic (Table 13). Chronologically expressed these items include stoneware with a salt glaze interior and exterior recovered from site 12-Bn-123 which was manufactured between 1800 to the 1860s (Stelle 2001). Amber glass recovered from site 12-Bn-123 was manufactured between the 1860s to present (Horn 2005:1). Clear glass recovered from sites 12-Bn-123 and 12-Bn-124 was manufactured between 1875 to present (IMACS 1992:473). Milk glass recovered from site 12-Bn-123 was manufactured between the 1890s to present (Horn 2005:1)

Table 12: Artifacts from Survey Area 4.

Prehistoric	No.	Historic	No.
Flake, Utilized	1	Ceramic, Stoneware	1
		Glass, Amber	3
		Glass, Clear	1
		Glass, Milk	1
		Iron	2
		Bone	1
		Brick (not collected)	150+
Total	**1**	**Total Collected**	**9**

Table 13: Historic Diagnostics from Survey Area 4.

Artifact Type	Site	Date Range	Citation
Stoneware with a salt glaze interior and exterior	12-Bn-123	1800-1860s	Stelle 2001
Amber glass	12-Bn-123	1860s to present	Horn 2005:1
Clear glass	12-Bn-123, 12-Bn-124	1875 to present	IMACS 1992:473
Milk glass	12-Bn-123	1890s to present	Horn 2005:1

Figure 45: Representative glass artifacts recovered from 12-Bn-123 in Survey Area 4 (Photo by Kiya Mullins, Ball State University).

Figure 46: Representative historic iron artifacts from Survey Area 4 (Photo by Kiya Mullins, Ball State University).

Sites

Two archaeological sites, 12-Bn-123 and 12-Bn-124, were recorded in Survey Area 4 (Figure 47 and Figure 48). Summaries for the individual sites are contained in Volume 2, Appendix F. Both sites had diagnostic artifacts (12-Bn-123 and 12-Bn-124). One site was a historic scatter (12-Bn-124) and the other site (12-Bn-123) was a multicomponent site with a historic scatter and a prehistoric isolate.

Both sites (12-Bn-123 and 12-Bn-124) were found on outwash terraces and outwash plains. One site was found on Free clay loam (Ft) (12-Bn-124) soils and site 12-Bn-123 was found on Tippecanoe silt loam (TlA) and Wea silt loam (WhA) soils.

Site 12-Bn-123 is a dense historic scatter with nine historic artifacts and over 150+ bricks. No sub-surface features were encountered in 12-Bn-123. Site 12-Bn-123, along with the rest of Survey Area 4, is in Sugar Grove, and could possibly be associated with a structure from Sugar Grove's historic occupation. While the three historic maps consulted (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009) do not show a historic structure located in Survey Area 4, the USGS 7.5' Earl Park, Indiana Quadrangle shows an outline of a structure at the location of Site 12-Bn-123. Sugar Grove was first occupied about 1832 by the Huett family and the Peck family. Ed Sumner settled in Sugar Grove in 1849 (F.A. Battey and Co. 1883:215-216). Site 12-Bn-123 is located on a small flat rise that overlooks Sugar Creek and is an ideal location for a structure. The Indiana Historical Aerial Photo Index (IHAPI) shows that a structure was positioned on the location of 12-Bn-123 as early as 1951 and disappearing between 1963 and 1971 (Indiana Geological Survey 2015). The variety of historic artifacts recovered includes bottle glass and stoneware, artifacts typically associated with domestic sites. The concentration of bricks (n=150+), typically not used for agricultural structures, again suggests site 12-Bn-123 was a domestic site. The variety of domestic artifacts and the historic structure indicate a potential to learn more about domestic mid-century farmhouse lifestyle, filling a gap in Benton County's history. Based on the archaeological evidence and our historic research, it appears that 12-Bn-123 has the potential to yield additional information beyond the Phase I level and should be considered potentially eligible under Criteria D for the National Register of Historic Places and recommended for additional research.

The site type associated with the other site in Survey Area 4 (12-Bn-124) is typically considered to not have the potential to yield additional information beyond the Phase I level and is therefore not considered eligible for the National Register of Historic Places.

Due to the irregular planting of the corn rows and the difficulty in surveying this parcel, Survey Area 4 was not completely surveyed. Given the alignment of this survey area with the

historical location of Sugar Grove, further survey of this parcel is recommended for future archaeological investigations, assuming field conditions improve and permission is granted.

Density

Survey Area 4 consisted of approximately 16.79 acres of outwash terraces and outwash plains. Within Survey Area 4, a density of one site per 8.40 acres occurred and sites covered 10.78 percent of the surface area.

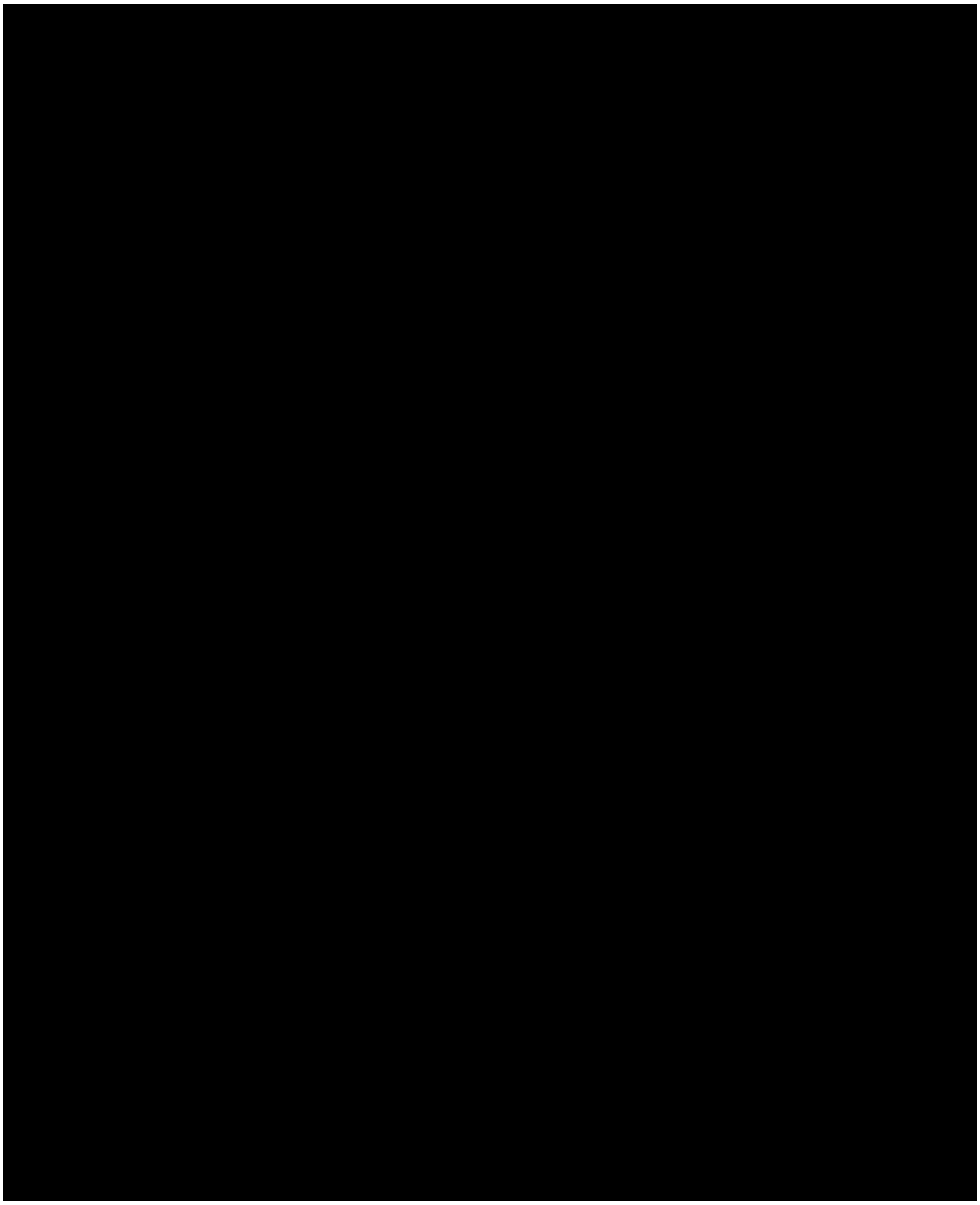

Figure 47: A portion of the USGS 7.5' Kentland, Indiana Quadrangle showing the location of sites 12-Bn-123 and 12-Bn-124.

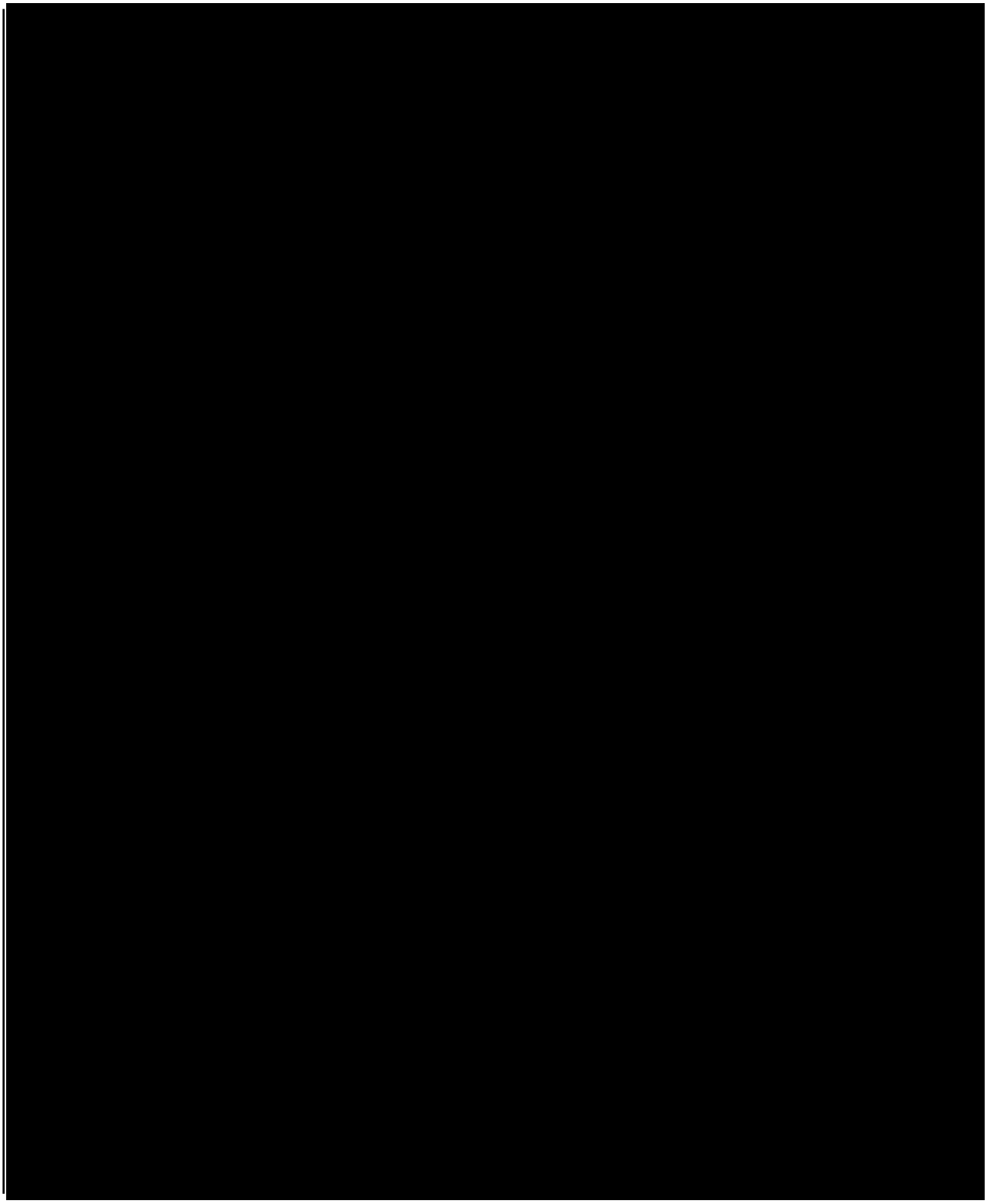

Figure 48: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-123 and 12-Bn-124.

Survey Area 5

Survey Area 5 was located in Gilboa Township in [redacted] Township 26 North, Range 6 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Templeton NE, Indiana Quadrangle (Figure 49 and Figure 50). The property was surveyed on August 4, 2015. The field surveyed was still planted in corn that was standing between seven to 11 feet tall. Ground surface visibility was approximately 70 to 90 percent with small amounts of corn debris, and the corn stalks themselves being the only visual obstacles. Due to high amounts of rainfall, there were two areas of ponding in the survey area, one located on the east side of the parcel and the other in the middle. Corn surrounding the ponding was much shorter, standing between three and five feet tall, and decomposing. Approximately 67.05 acres were surveyed consisting of end and ground moraines. The area contained Chalmers (Ch), Corwin (CsB2),Gilboa (GlB), Montmorenci (MxB2), Odell (OlB2), and Wallkill (Wa) soils. Six sites were encountered during the survey. The sites ranged in size from prehistoric isolated finds to a historic scatter of 160.71 square meters (0.45 acres).

[redacted]

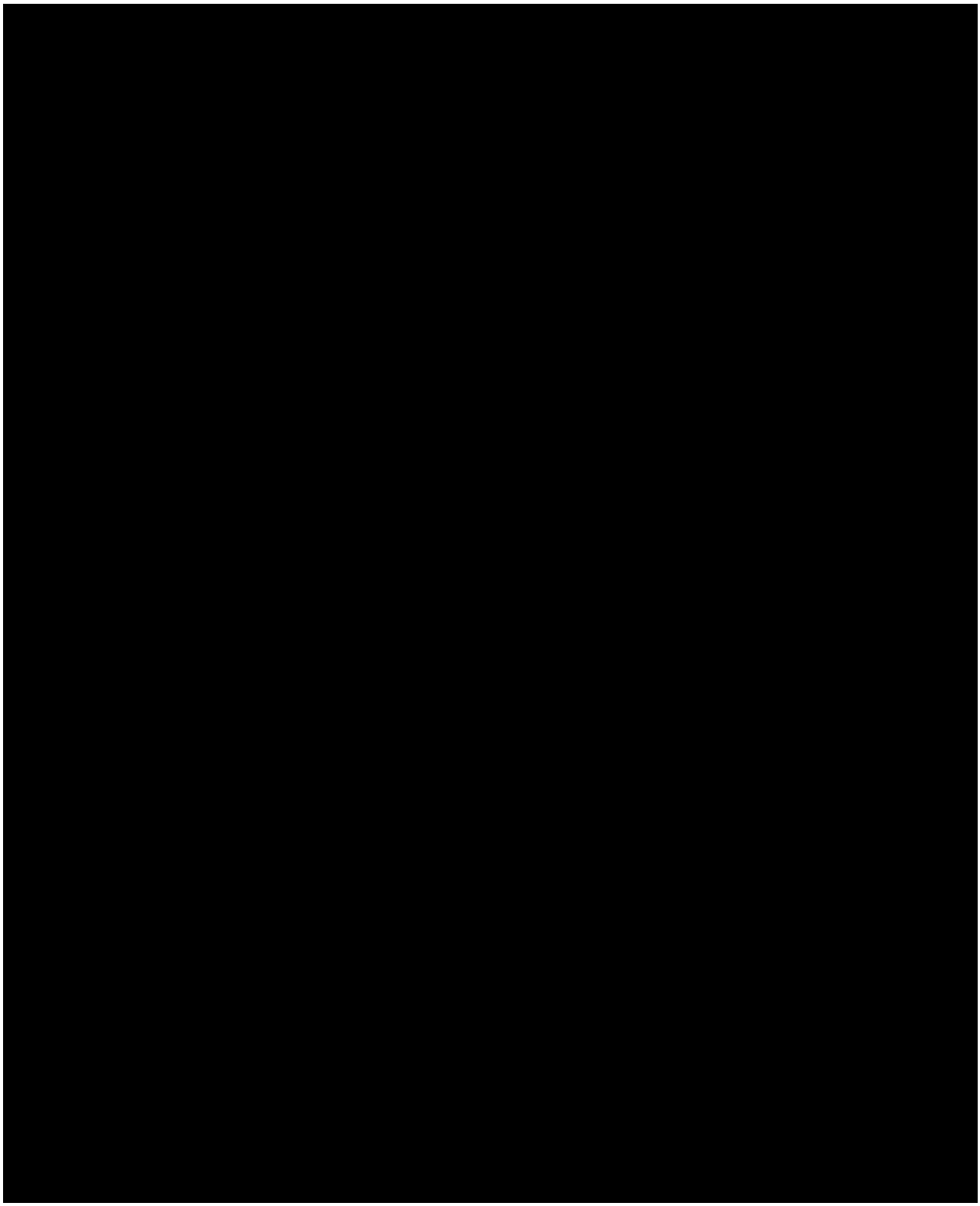

Figure 49: A portion of the map of Gilboa Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 5.

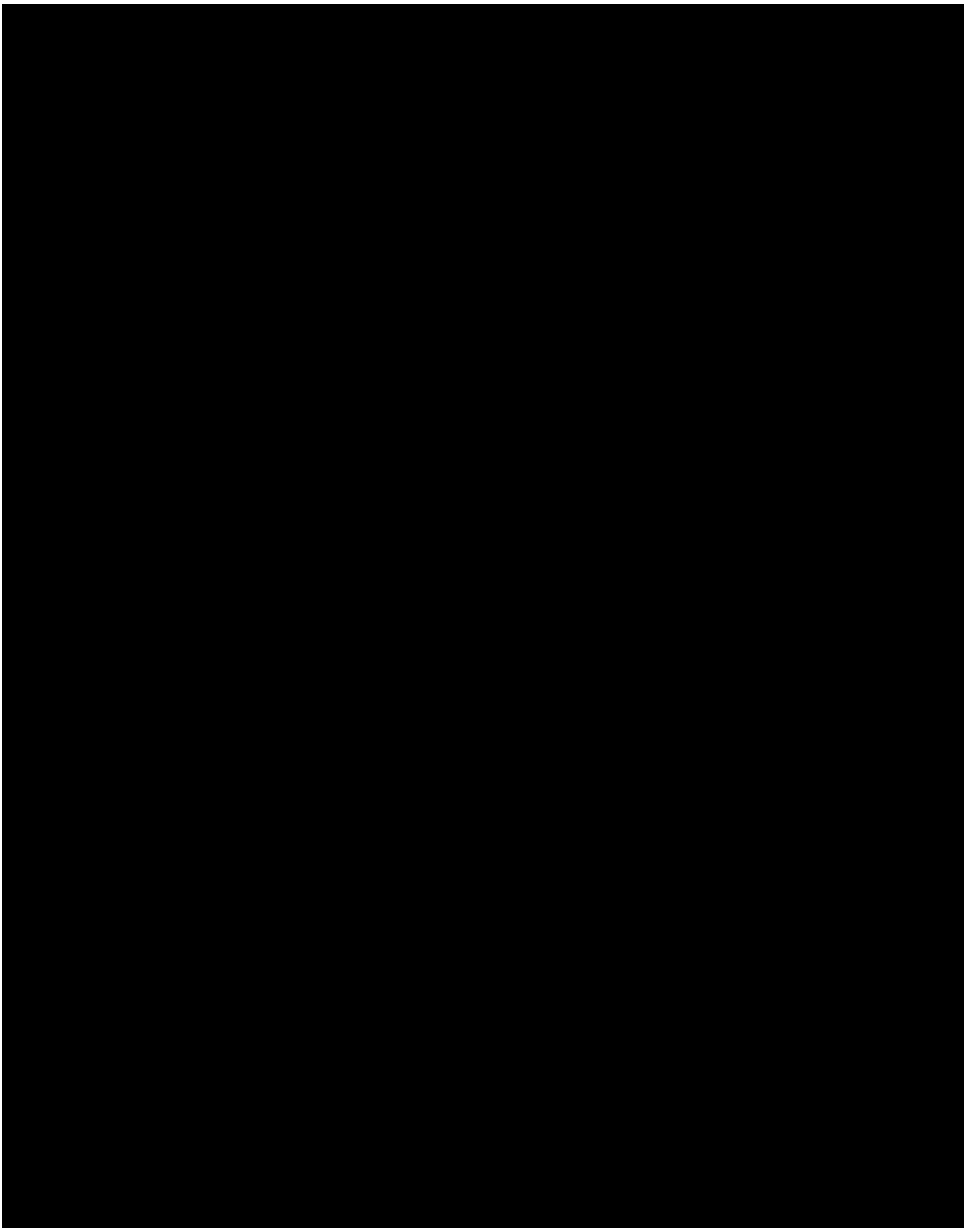

Figure 50: A portion of the USGS 7.5' Templeton NE, Indiana Quadrangle showing the location of Survey Area 5.

Artifacts

A total of 175 artifacts were encountered in Survey Area 5. Table 14 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 51 through Figure 54. Artifacts are listed by individual site in Volume 2, Appendix E.

Eleven prehistoric artifacts were recovered. No diagnostic prehistoric artifacts were recovered from Survey Area 5 (Figure 51).

One hundred and sixty-four historic artifacts were recovered from Survey Area 5 and of those, 163 are diagnostic (Table 15). Chronologically expressed these items include aqua glass recovered from sites 12-Bn-125 and 12-Bn-126 which was manufactured between 1800 to the 1920s (Horn 2005:1). Green-turquoise glass from site 12-Bn-125 was manufactured between 1800 to the 1920s (Horn 2005:1). Plain whiteware recovered from site 12-Bn-125 was manufactured from 1820 to present (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and a Bristol glaze exterior recovered from site 12-Bn-125 was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Plain ironstone recovered from sites 12-Bn-125 and 12-Bn-126 was manufactured between 1842 to 1930 (Miller 2000; Stelle 2001:Chapter I). Amber glass recovered from site 12-Bn-125 was manufactured between the 1860s to present (Horn 2005:1). Clear glass recovered from site 12-Bn-125 was manufactured between 1875 to present (IMACS 1992:473). Amethyst glass recovered from site 12-Bn-125 was manufactured from 1885 to 1920 (Horn 2005:1). Milk glass recovered from site 12-Bn-125 was manufactured between the 1890s to present (Horn 2005:1). Cobalt glass recovered from site 12-Bn-125 was manufactured between the 1890s to present (Horn 2005:1). Semi-Porcelain with hand painted floral pattern recovered from site 12-Bn-125 was manufactured between 1890 to present (ODOT 1991:177). Stoneware with Albany glaze interior and exterior recovered from site 12-Bn-125 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with a salt glaze interior and exterior recovered from site 12-Bn-125 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I).

Table 14: Artifacts from Survey Area 5.

Prehistoric	No.	Historic	No.
Biface, Scraper	1	Ceramic, Porcelain	1
Flake, Retouched	2	Ceramic, Ironstone	8
Flake, Medial	3	Ceramic, Whiteware	26
Flake, Proximal	2	Ceramic, Stoneware	17
Flake, Distal	1	Glass, Amber	6
Flake	2	Glass, Amethyst	13
		Glass, Aqua	30
		Glass, Clear	43
		Glass, Cobalt	1
		Glass, Milk	8
		Glass, Green	3
		Glass, Green/Turquoise	6
		Iron	1
		Charcoal/clinker	1
Total	**11**	**Total**	**164**

Table 15: Historic Diagnostics from Survey Area 5.

Artifact Type	Site	Date Range	Citation
Aqua glass	12-Bn-125, 12-Bn-126	1800-1920s	Horn 2005:1
Green-turquoise glass	12-Bn-125	1800-1920s	Horn 2005:1
Plain whiteware	12-Bn-125	1820 to present	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and Bristol glaze exterior	12-Bn-125	1830-1940	Stelle 2001:Chapter I
Plain ironstone	12-Bn-125, 12-Bn-126	1842-1930	Miller 2000; Stelle 2001:Chapter I
Amber glass	12-Bn-125	1860s to present	Horn 2005:1
Clear glass	12-Bn-125	1875 to present	IMACS 1992:473
Amethyst glass	12-Bn-115	1885-1920	Horn 2005:1
Milk glass	12-Bn-125	1890s to present	Horn 2005:1
Cobalt glass	12-Bn-125	1890s to present	Horn 2005:1
Semi-Porcelain with hand painted floral pattern	12-Bn-125	1890 to present	ODOT 1991:177
Stoneware with Albany glaze interior and exterior	12-Bn-125	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with a salt glaze interior and exterior	12-Bn-125	Termination date of 1940	Stelle 2001:Chapter I

Figure 51: Representative prehistoric artifacts from Survey Area 5 (Photo by Kiya Mullins, Ball State University).

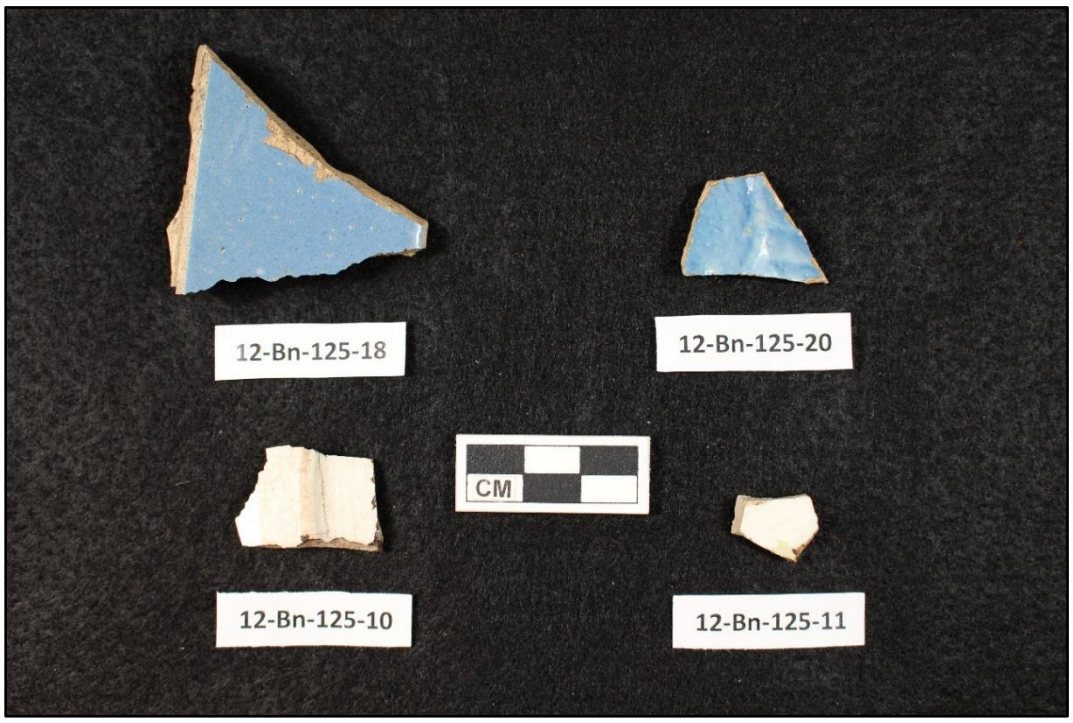

Figure 52: Representative historic ceramics from Site 12-Bn-125 (Photo by Kiya Mullins, Ball State University).

Figure 53: Representative historic glass from Site 12-Bn-125 (Photo by Kiya Mullins, Ball State University).

Figure 54: Representative iron and coal historic artifacts from Site 12-Bn-125 (Photo by Kiya Mullins, Ball State University).

Sites

Six archaeological sites, (12-Bn-125 to 12-Bn-130), were recorded in Survey Area 5 (Figure 55 and Figure 56). Summaries for the individual sites are contained in Volume 2, Appendix F. Two sites (12-Bn-125 and 12-Bn-126) had diagnostic artifacts. Two (12-Bn-129 and 12-Bn-130) of the sites were prehistoric isolated finds and two (12-Bn-127 and 12-Bn-128) sites were lithic scatters. Two sites (12-Bn-125 and 12-Bn-126) were historic scatters.

All six sites were found on end moraines and ground moraines (12-Bn-125 to 12-Bn-130). Two sites (12-Bn-128 and 12-Bn-129) were found on Odell silt loam (OlB2) soil and one site (12-Bn-130) was found on Montmorenci silt loam (MxB2) soil. Three sites (12-Bn-125 to 12-Bn-127) were found on multiple soil types. Two sites (12-Bn-126 and 12-Bn-127) were found on Chalmers silty clay loam (Ch) and Corwin silt loam (CsB2) soils, and one site (12-Bn-125) was found on Chalmers silty clay loam (Ch) and Montmorenci silt loam (MxB2) soils.

Site 12-Bn-125 was a medium sized historic scatter, similar to 12-Bn-107 with a larger and more diverse inventory (see Appendix F), much larger and denser than the other sites in Survey Area 5. No sub-surface features or evidence of historic structures were encountered in 12-Bn-125. Three historic maps (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:37) were consulted to assess potential for intact historic deposits. While historic maps failed to reveal any structures within or near the scatter, historic maps do show the relative proximity to Denton's or Walnut Grove (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:37; see Figure 49). Denton's Grove was the settlement location for Joseph and John Denton and their families. The Grove was inhabited by the families until they died and was not occupied afterwards (Royalty 1917:198). With no structural remnants or subsurface features encountered, it is possible that 12-Bn-125 was a historic dump site, rather than a primary deposit, for Denton's Grove. Site 12-Bn-125 and 12-Bn-107 occupy very similar environmental and topographic settings. Both are located on the edge of an alfisol and a prairie soil (dry prairie for 12-Bn-107 and wet prairie for 12-Bn-125) along the 750 ft contour (see Figure 29 and Figure 55), on a slope. The tight clustering of the artifacts suggests that topography played a part in the formation of the site. Hill slope middens are common features of 19th century farmsteads. The location of site 12-Bn-125 on a slope makes it unlikely that a structure would have been erected where the scatter was located. While 12-Bn-125 does not appear to have been a settlement or structure location, substantial information about the lives of the Dentons or other early settlers could be contained in this slope midden. Given the general lack of information about other settlers inhabiting this area in the late 19th century, there is significant potential to gain new information about this period of the settlement of Benton County. Based on the archaeological evidence and our historic research, 12-Bn-125 is potentially eligible under Criteria D.

The remaining site types (12-Bn-126 to 12-Bn-130) found in Survey Area 5 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 5 consisted of approximately 67.05 acres of end moraines and ground moraines. Within Survey Area 5, a density of one site per 11.18 acres occurred and sites covered 1.94 percent of the surface area.

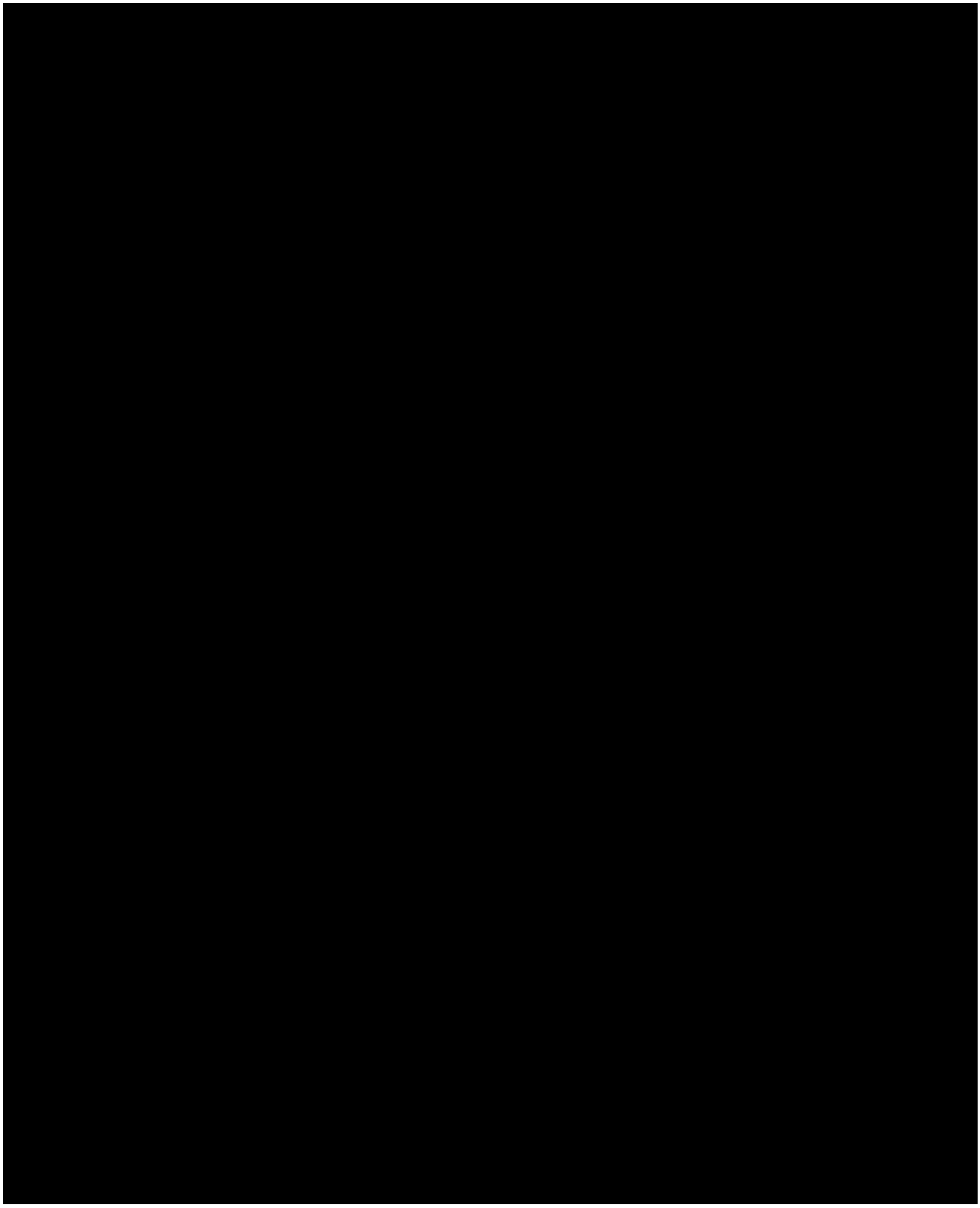

Figure 55: A portion of the USGS 7.5' Templeton NE, Indiana Quadrangle showing the location of sites 12-Bn-125 to 12-Bn-130.

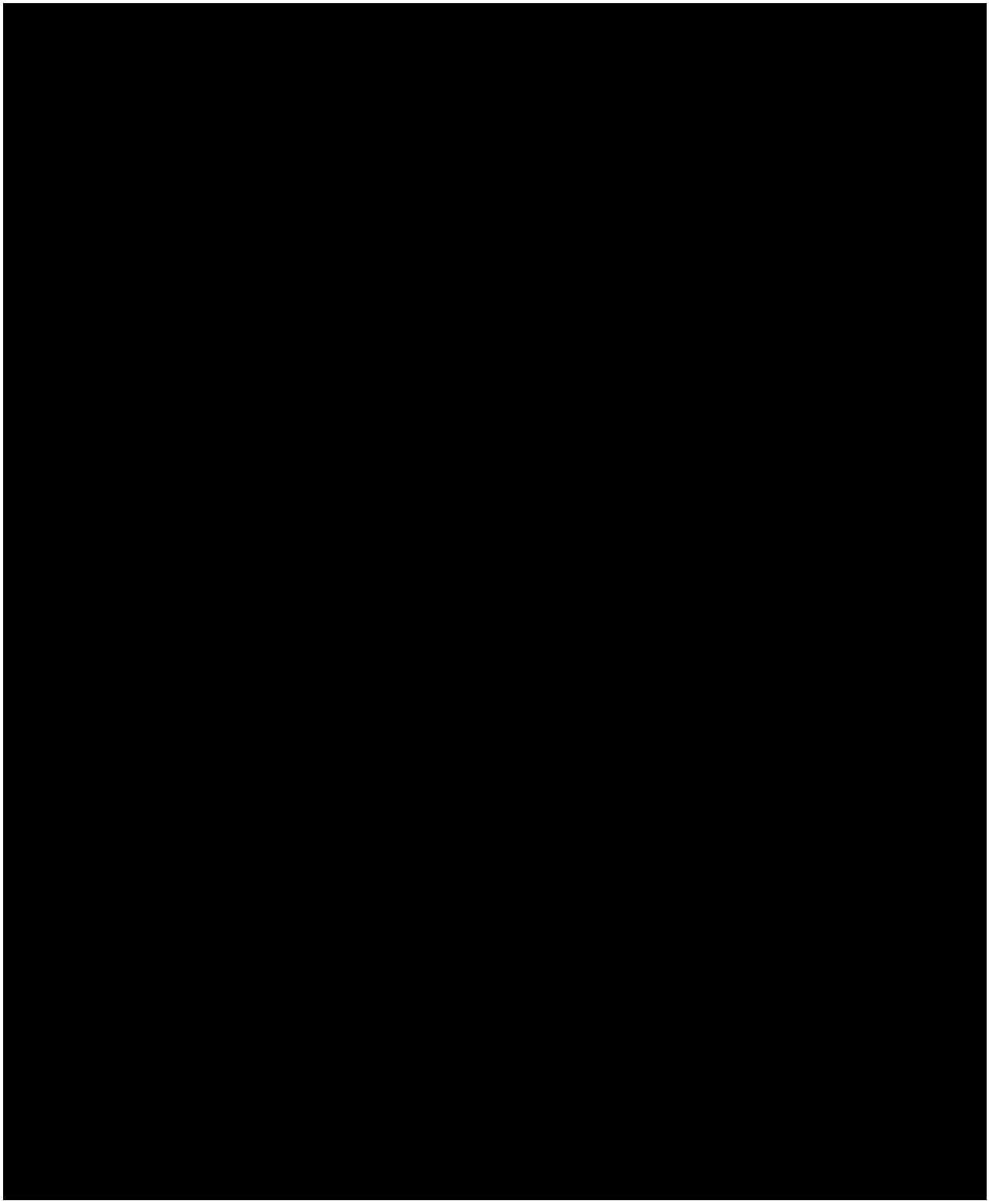

Figure 56: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-125 to 12-Bn-130.

Survey Area 6

Survey Area 6 was located in Richland Township in [redacted], Township 26 North, Range 8 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Wadena, Indiana Quadrangle (Figure 57 and Figure 58). The property was surveyed on August 5, 2015. Ground surface visibility was approximately 70 to 90 percent with small amounts of corn debris, and the corn stalks themselves being the only visual obstacles. Approximately 27.00 acres were surveyed consisting of flood plains. The area consisted of Comfrey (Ck), Crane (Cu), Peotone (Pn), and Selma (Sh) soils. Two sites were encountered during the survey. The sites were a historic isolated find and a historic scatter of 1173.58 square meters (0.29 acres).

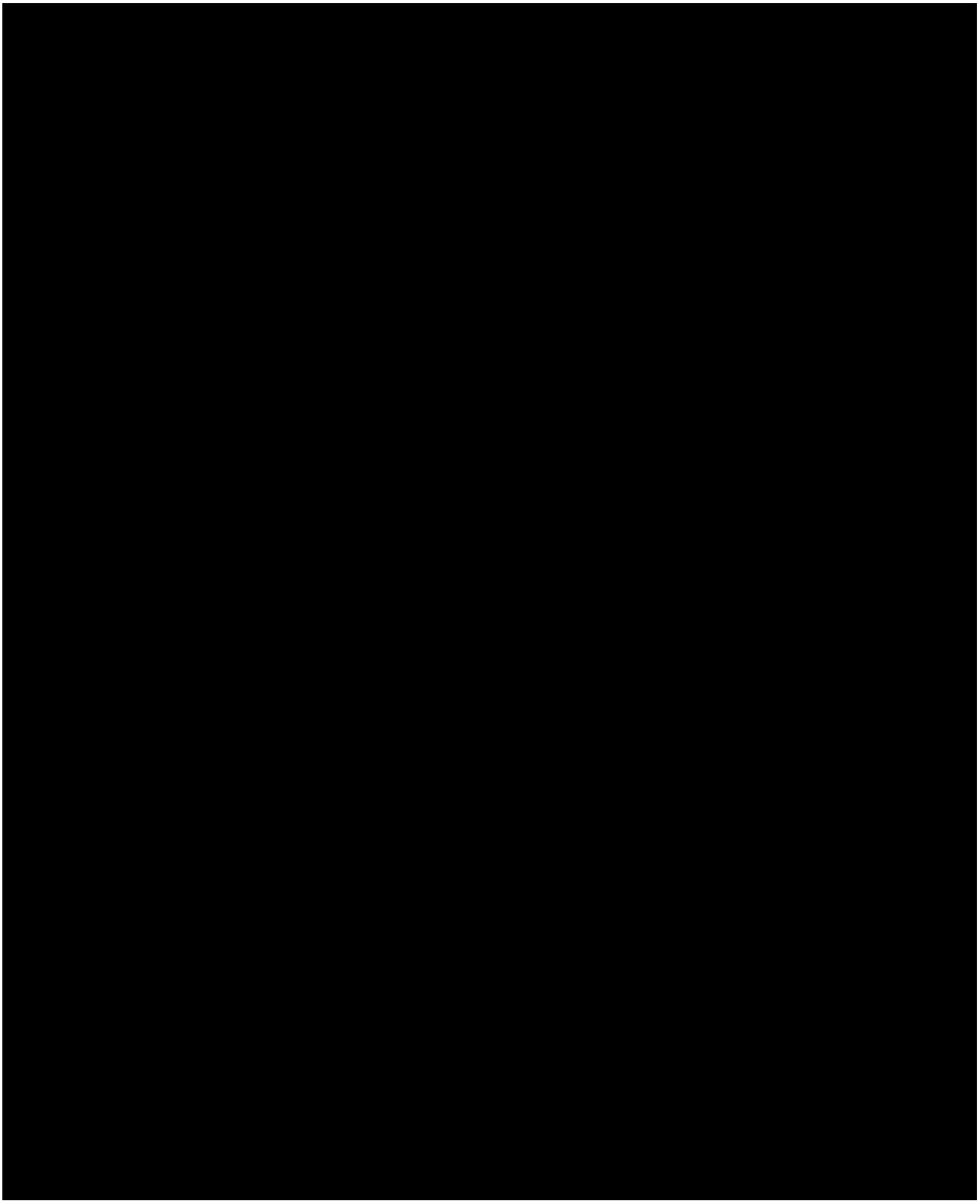

Figure 57: A portion of the map of Richland Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 6.

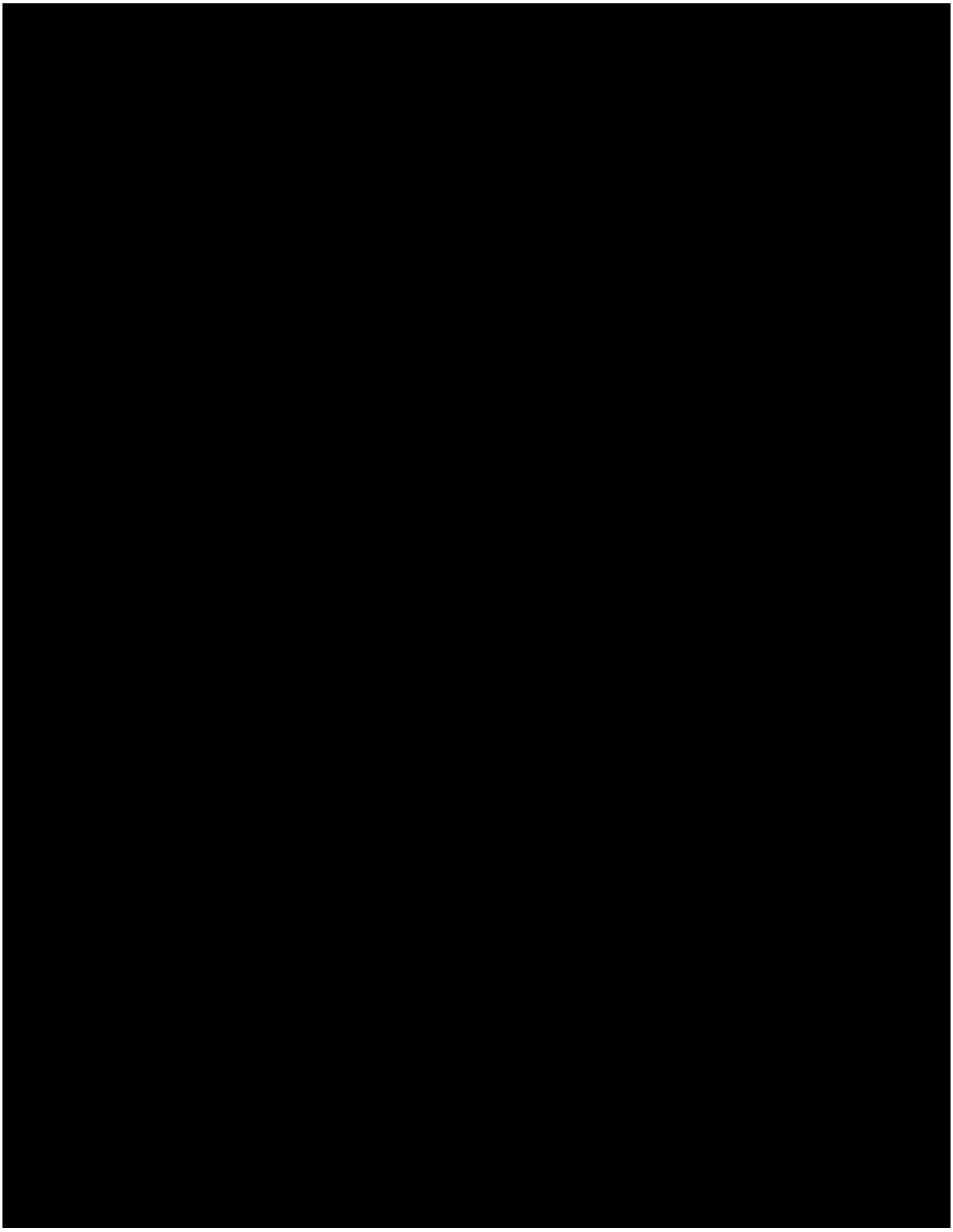

Figure 58: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of Survey Area 6.

Artifacts

A total of four artifacts were encountered in Survey Area 6. Table 16 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 59. Artifacts are listed by individual site in Volume 2, Appendix E.

No prehistoric artifacts were recovered from Survey Area 6.

Four historic artifacts were recovered from Survey Area 6 and all are diagnostic (Table 17). Chronologically expressed these items include stoneware with Albany glaze interior and a Bristol glaze exterior recovered from site 12-Bn-131 which was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Clear glass recovered from site 12-Bn-132 was manufactured between 1875 to present (IMACS 1992:473). Cobalt glass recovered from site 12-Bn-131 was manufactured between the 1890s to present (Horn 2005:1). Stoneware with Albany glaze interior and exterior recovered from site 12-Bn-131 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I).

Table 16: Artifacts from Survey Area 6.

Prehistoric	No.	Historic	No.
		Ceramic, Stoneware	2
		Glass, Clear	1
		Glass, Cobalt	1
Total	**0**	**Total**	**4**

Table 17: Historic Diagnostics from Survey Area 6.

Artifact Type	Site	Date Range	Citation
Stoneware with Albany glaze interior and a Bristol glaze exterior	12-Bn-131	1830-1940	Stelle 2001:Chapter I
Clear glass	12-Bn-132	1875 to present	IMACS 1992:473
Cobalt glass	12-Bn-131	1890s to presnt	Horn 2005:1
Stoneware with Albany glaze interior and exterior	12-Bn-131	Termination date of 1940	Stelle 2001:Chapter 1

Figure 59: Historic artifacts from Survey Area 2 (Photo by Kiya Mullins, Ball State University).

Sites

Two archaeological sites, 12-Bn-131 and 12-Bn-132, were recorded in Survey Area 6 (Figure 60 and Figure 61). Summaries for the individual sites are contained in Volume 2, Appendix F. Two sites (12-Bn-131 and 12-Bn-132) had diagnostic artifacts. One site (12-Bn-132) was a historic isolated find and one site (12-Bn-131) was a historic scatter.

The two sites were discovered on flood plains (12-Bn-131 and 12-Bn-132). One site (12-Bn-132) was found on Comfrey silty clay loam (Ck) soil. One site (12-Bn-131) was found on Selma silty clay loam (Sh).

The site types found in Survey Area 6 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 6 consisted of approximately 27.00 acres of flood plains. Within Survey Area 6, a density of one site per 13.5 acres occurred and sites covered 1.70 percent of the surface area.

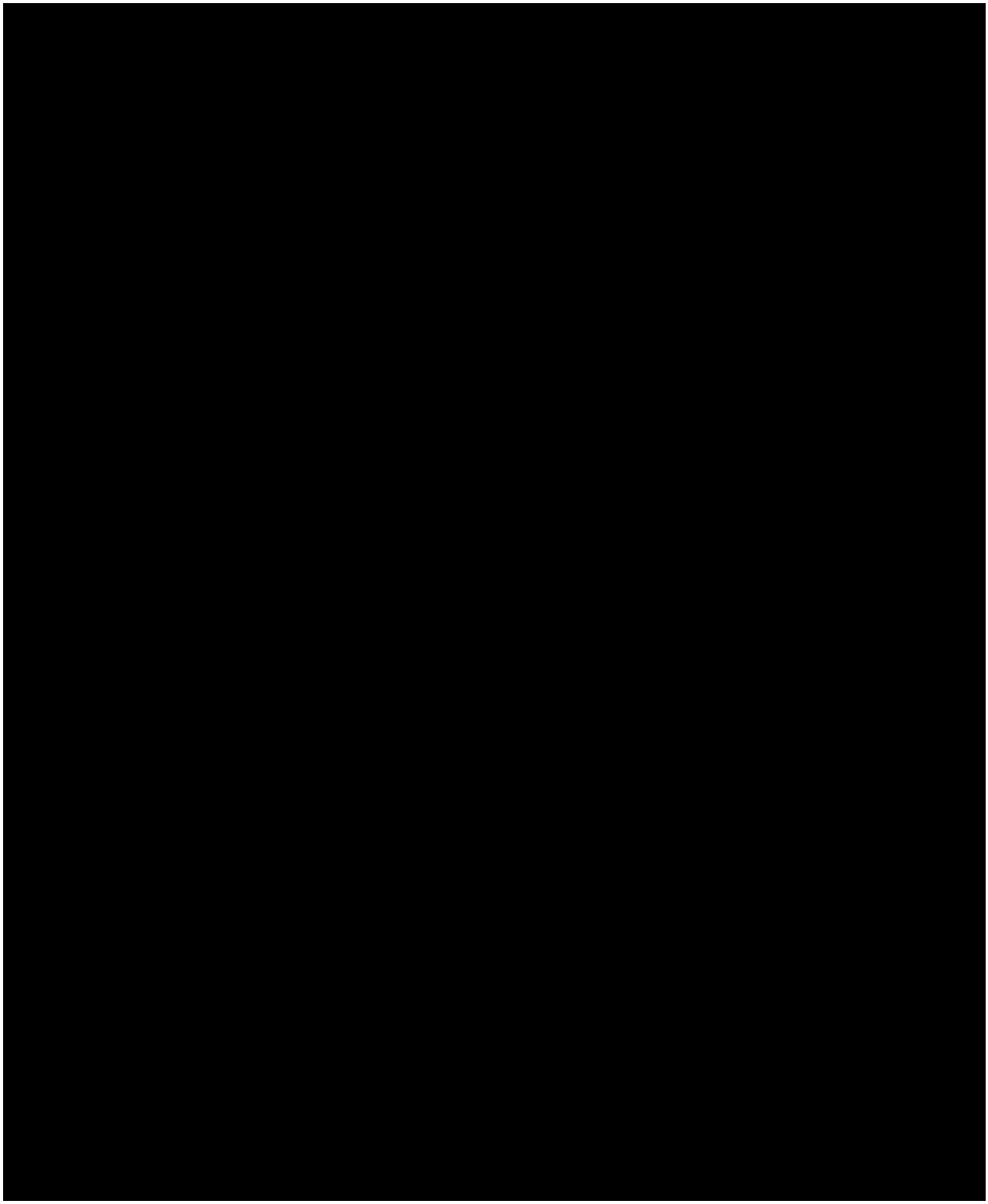

Figure 60: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of sites 12-Bn-131 and 12-Bn-132.

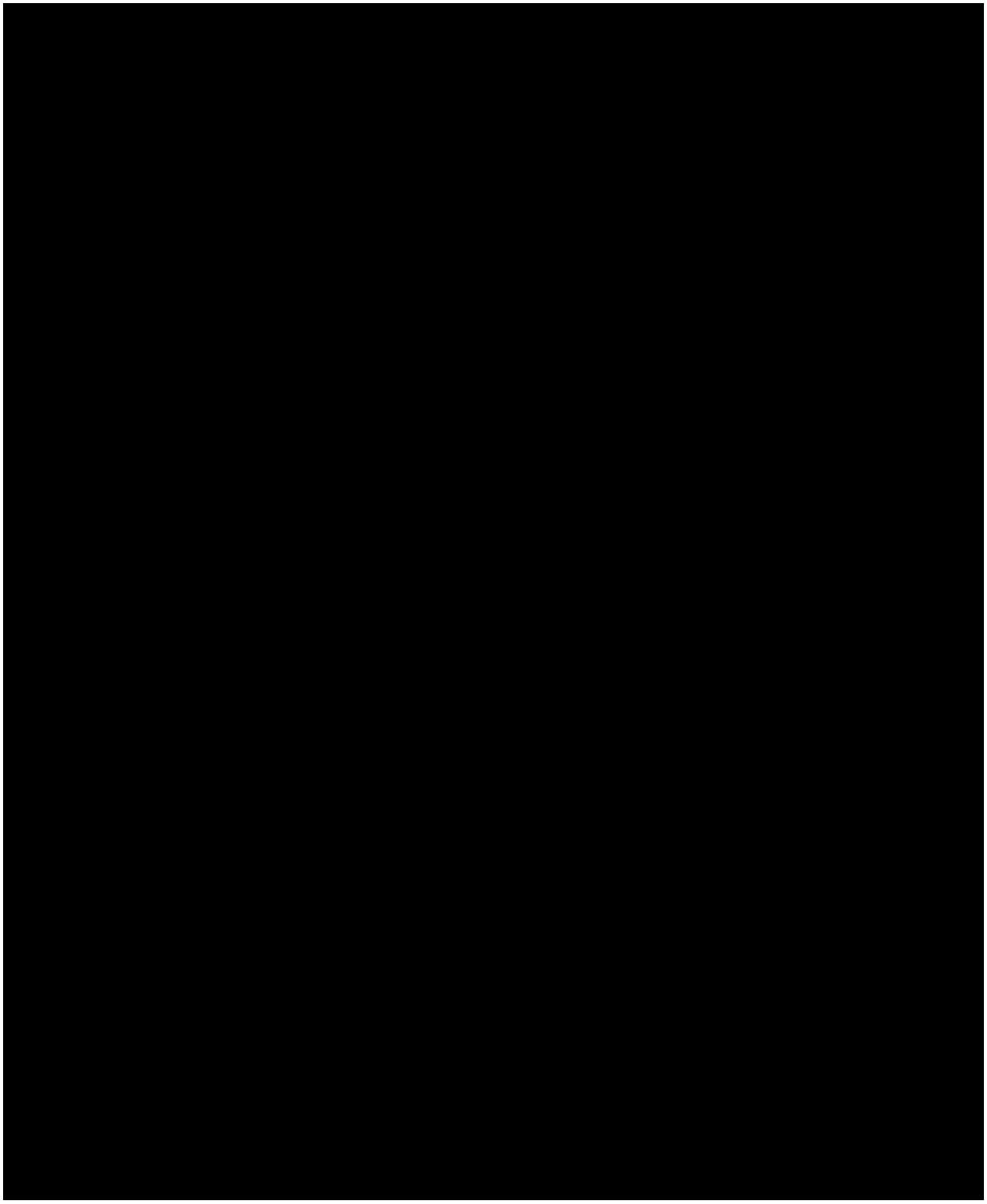

Figure 61: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-131 and 12-Bn-132.

Survey Area 7

Survey Area 7 was located in Gilboa Township in [redacted] Township 26 North, Range 6 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Mount Gilboa, Indiana Quadrangle (Figure 62 and Figure 63). The property was surveyed on August 6, 2015. The fields were planted in corn that was standing. Ground surface visibility was approximately 80 to 90 percent with small amounts of corn debris and the corn stalks themselves being the only visual obstacles. This field operates as a test plot and as such had every fifth row of corn (male plants) removed mid-season. The row removal was coupled with the removal of the top remaining standing corn leaving it approximately standing between two and four feet tall. A 50 meter section on the western boundary was planted in soy beans that was standing between six and 24 inches tall and soy debris and the soy plants themselves were the only visual obstacles. Approximately 36.58 acres were surveyed consisting of end moraines and ground moraines. The area contained Chalmers (Ch), Darroch (Dp), Montmorenci (MxB2), and Odell (OlA) soils. Four sites were encountered during the survey. The sites ranged in size from prehistoric and historic isolated finds to a historic scatter of 2468.58 square meters (0.61 acres).

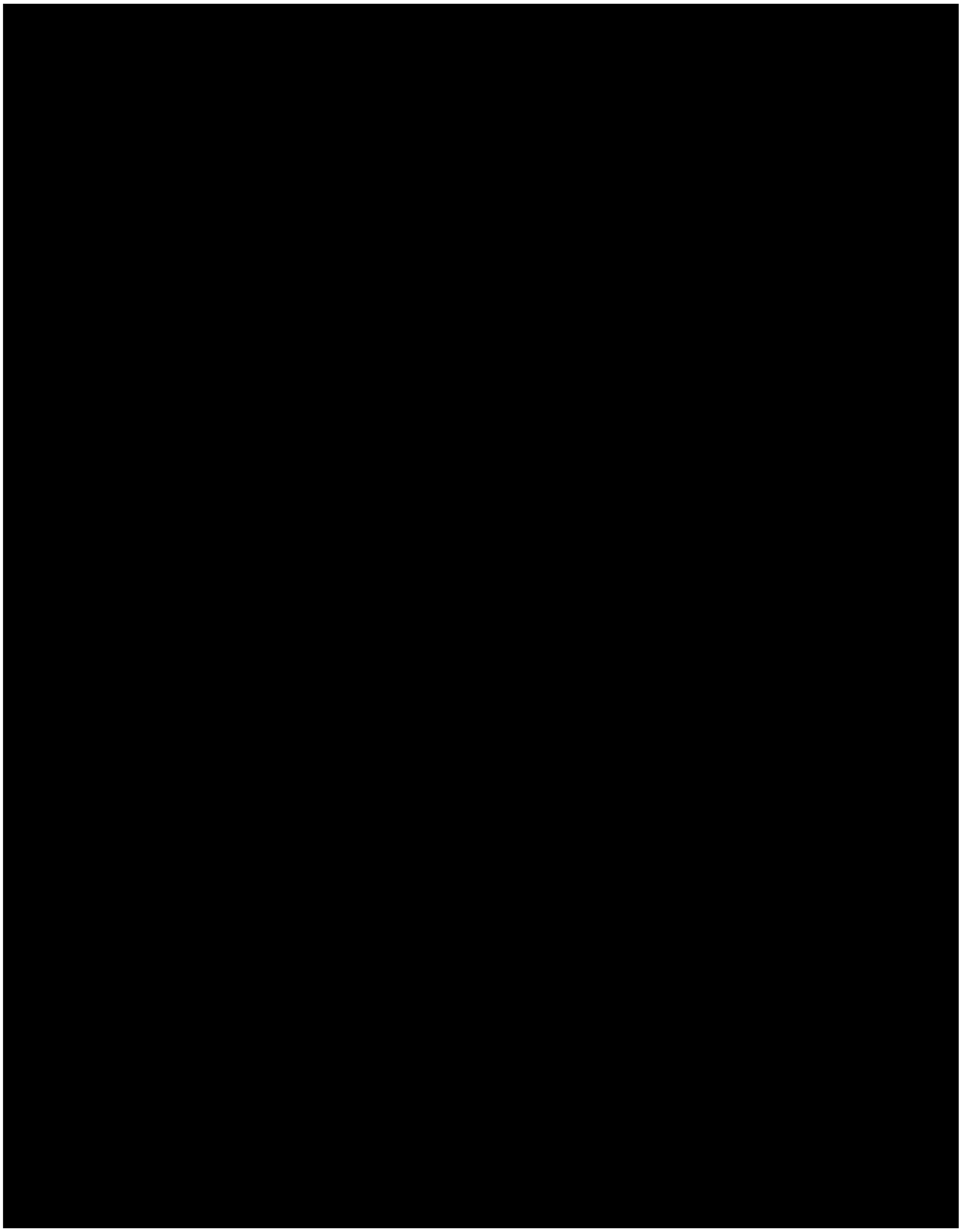

Figure 62: A portion of the map of Gilboa Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 7.

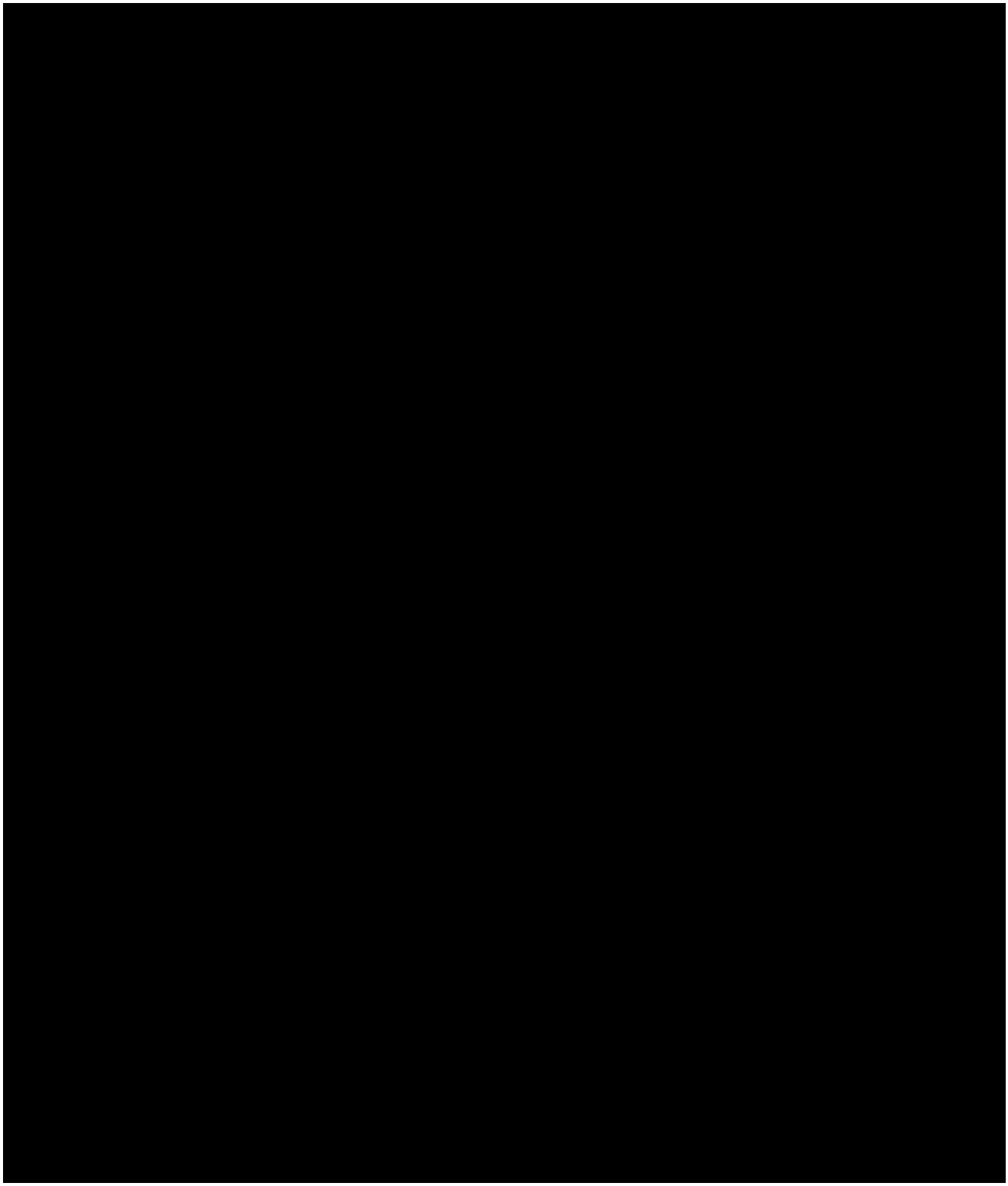

Figure 63: A portion of the USGS 7.5' Mount Gilboa, Indiana Quadrangle showing the location of Survey Area 7.

Artifacts

A total of twenty-seven artifacts were encountered in Survey Area 7. Table 18 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 64 through Figure 67. Artifacts are listed by individual site in Volume 2, Appendix E.

Three prehistoric artifacts were recovered. No diagnostic prehistoric artifacts were recovered from Survey Area 7 (Figure 64).

Twenty-four historic artifacts were recovered from Survey Area 7 and of those, 23 are diagnostic. Chronologically expressed these items include aqua glass recovered from sites 12-Bn-133 and 12-Bn-136 which was manufactured between 1800 to the 1920s (Horn 2005:1). Plain whiteware recovered from site 12-Bn-133 was manufactured from 1820 to present (Stelle 2001:Chapter I). Whiteware with Scratch Brown glaze exterior recovered from site 12-Bn-133 was manufactured from 1829 to 1839 (Stelle 2001:Chapter 1). Stoneware with Albany glaze interior and a Bristol glaze exterior recovered from site 12-Bn-133 was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Stoneware with Bristol glaze interior and exterior recovered from site 12-Bn-133 was manufactured between 1835 to present (Stelle 2001:Chapter I). Plain ironstone recovered from site 12-Bn-133 was manufactured between 1842 to 1930 (Miller 2000; Stelle 2001:Chapter I). Clear glass recovered from sites 12-Bn-133 and 12-Bn-135 was manufactured between 1875 to present (IMACS 1992:473). Amethyst glass recovered from site 12-Bn-133 was manufactured between 1885 and 1920 (Horn 2005:1). Milk glass recovered from site 12-Bn-133 was manufactured between the 1890s to present (Horn 2005:1). Stoneware with Albany glaze interior and exterior recovered from site 12-Bn-133 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I).

Table 18: Artifacts from Survey Area 7.

Prehistoric	No.	Historic	No.
Flake, Proximal	1	Ceramic, Ironstone	1
Core	1	Ceramic, Whiteware	6
Flake	1	Ceramic, Stoneware	8
		Glass, Amethyst	1
		Glass, Aqua	4
		Glass, Clear	2
		Glass, Milk	1
		Iron	1
Total	**3**	**Total**	**24**

Table 19: Historic Diagnostics from Survey Area 7.

Artifact Type	Site	Date Range	Citation
Aqua glass	12-Bn-133, 12-Bn-136	1800-1920s	Horn 2005:1
Plain whiteware	12-Bn-133	1820 to present	Stelle 2001:Chapter I
Whiteware with Scratch Brown glaze exterior	12-Bn-133	1829-1839	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and a Bristol glaze exterior	12-Bn-133	1830-1940	Stelle 2001:Chapter I
Stoneware with Bristol glaze interior and exterior	12-Bn-133	1835 to present	Stelle 2001:Chapter I
Plain ironstone	12-Bn-133	1842-1930	Miller 2000; Stelle 2001:Chapter I
Clear glass	12-Bn-133, 12-Bn-135	1875 to present	IMACS 1992:473
Amethyst glass	12-Bn-133	1890s to present	Horn 2005:1
Stoneware with Albany glaze interior and exterior	12-Bn-133	Termination date of 1940	Stelle 2001:Chapter I

Figure 64: Representative prehistoric artifacts from Survey Area 7 (Photo by Kiya Mullins, Ball State University).

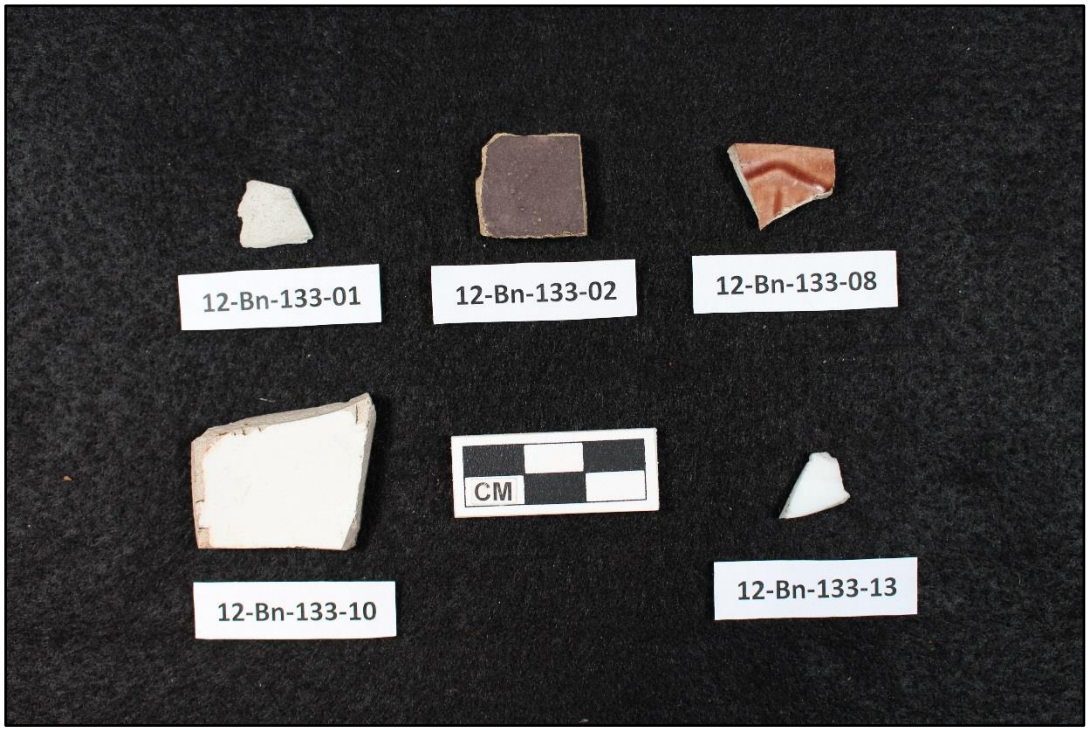

Figure 65: Representative ceramic historic artifacts from Survey Area 7 (Photo by Kiya Mullins, Ball State University).

Figure 66: Representative historic glass artifacts from Survey Area 7 (Photo by Kiya Mullins, Ball State University).

Figure 67: Representative historic metal artifact from Survey Area 7 (Photo by Kiya Mullins, Ball State University).

Sites

Four archaeological sites, 12-Bn-133 to 12-Bn-136, were recorded in Survey Area 7 (Figure 68 and Figure 69). Summaries for the individual sites are contained in Volume 2, Appendix F. Three sites had diagnostic artifacts (12-Bn-133, 12-Bn-135, and 12-Bn-136). One site was a prehistoric lithic scatter (12-Bn-134). One site was a historic isolated find (12-Bn-136) and one site was a historic scatter (12-Bn-133). One site was a multicomponent site (12-Bn-135) with a prehistoric isolate and historic isolate.

All four sites (12-Bn-133, 12-Bn-134, 12-Bn-135, and 12-Bn-136) were discovered on end moraines and ground moraines. One site (12-Bn-136) was found on Chalmers silty clay loam (Ch) soils. One site (12-Bn-135) was found on Montmorenci silt loam (MxB2). Two sites were found on multiple soil types. One site (12-Bn-133) was found on Chalmers silty clay loam (Ch) and Darroch silt loam (Dp), and one site (12-Bn-134) was found on Chalmers silty clay loam (Ch) and Odell silt loam (OlA) soils.

The site types found in Survey Area 7 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 7 consisted of approximately 36.58 acres of end moraines and ground moraines. Within Survey Area 7, a density of one site per 9.15 acres occurred and sites covered 3.06 percent of the surface area.

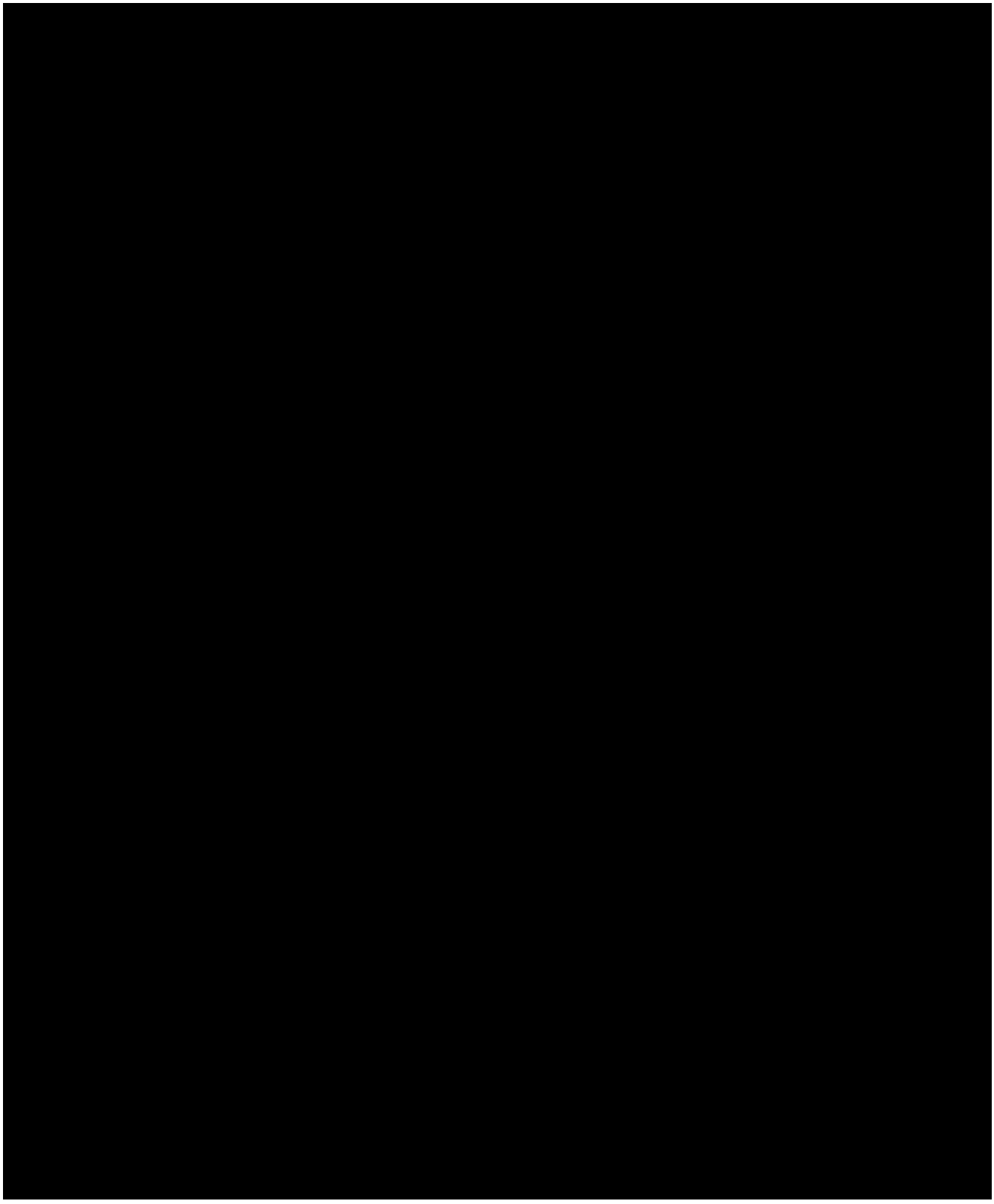

Figure 68: A portion of the USGS 7.5' Mount Gilboa, Indiana Quadrangle showing the location of sites 12-Bn-133 to 12-Bn-136.

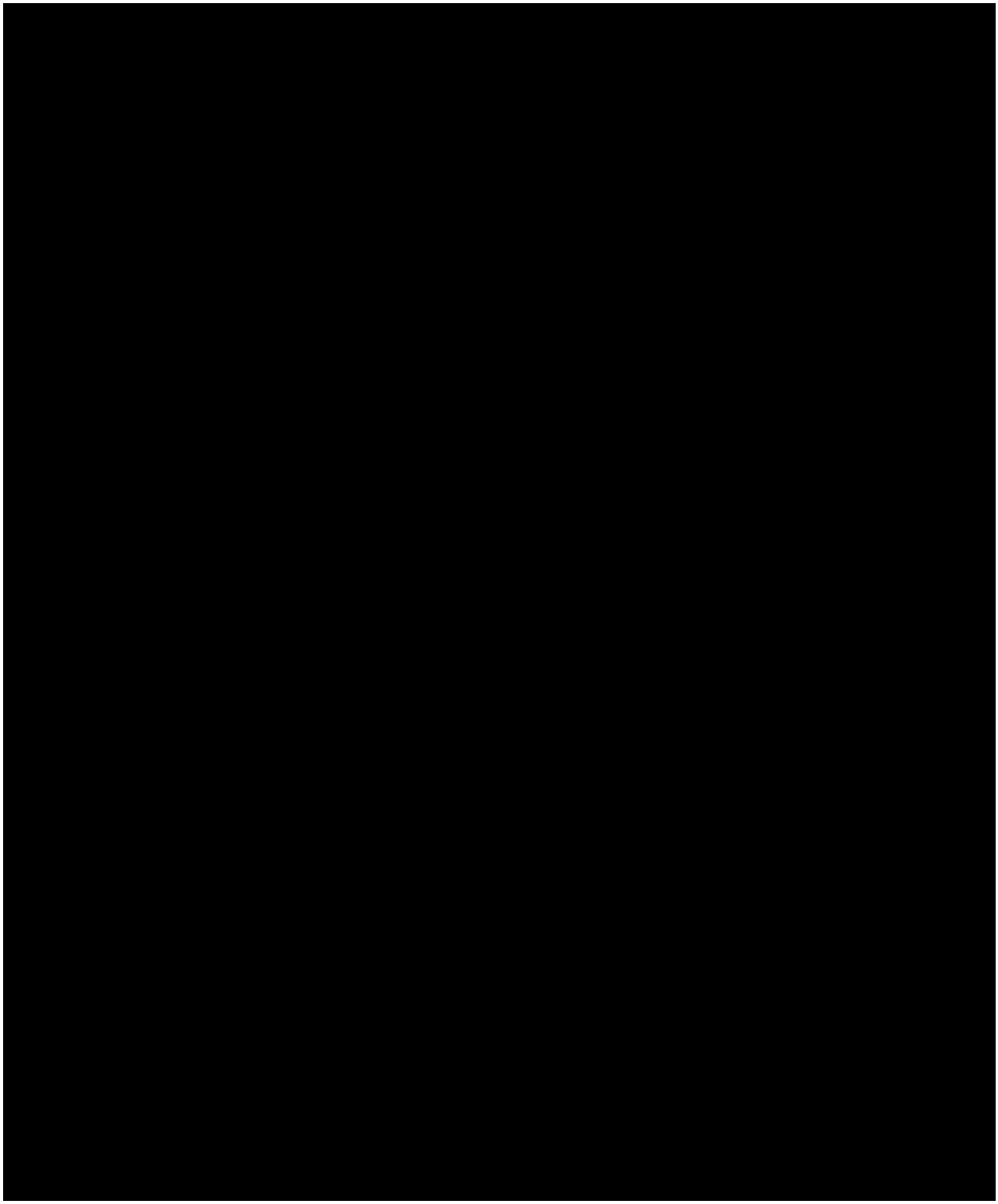

Figure 69: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-133 to 12-Bn-136.

Survey Area 8

Survey Area 8 was located in Union Township in [redacted] Township 26 North, Range 8 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Wadena, Indiana Quadrangle (Figure 70 and Figure 71). The field was planted with corn standing seven to eleven feet tall. The property was surveyed on August 7, 2015 and September 13, 2015. Ground surface visibility was approximately 80 to 90 percent with small amounts of corn debris, and the corn stalks themselves being the only visual obstacles. Approximately 195.97 acres were surveyed consisting of end moraines and ground moraines. The area contained Barce (BaB2), Chalmers (Ch), Crane (Cu), Darroch (Do and Dp), Foresman (FoB2), Gilboa (GlA and GlB), Montmorenci (MxB2), Odell (OlA and OlB2), and Selma (Sh) soils. Three sites were encountered during the survey. The sites were all historic isolated finds.

[redacted]

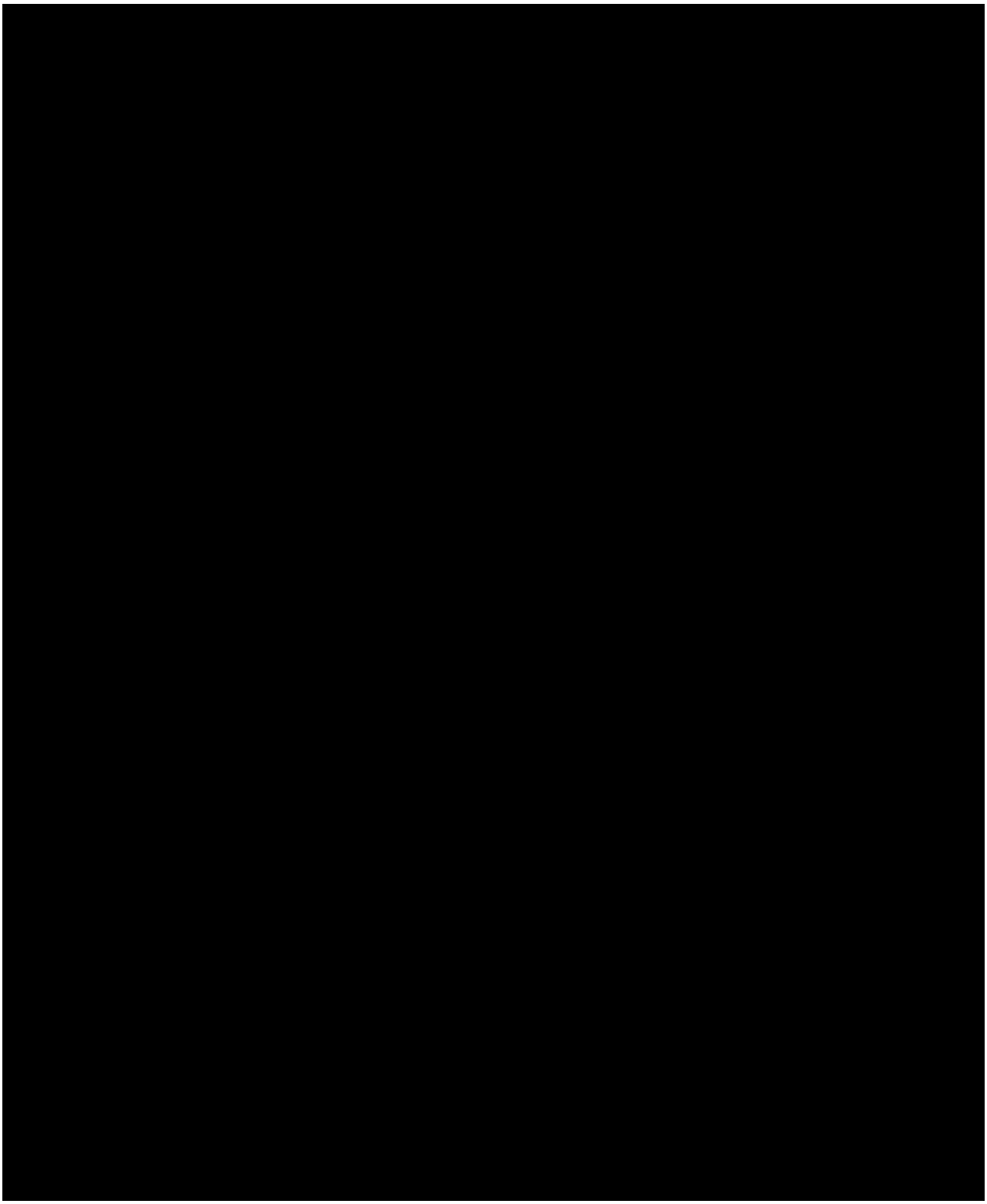

Figure 70: A portion of the map of Union Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 8 .

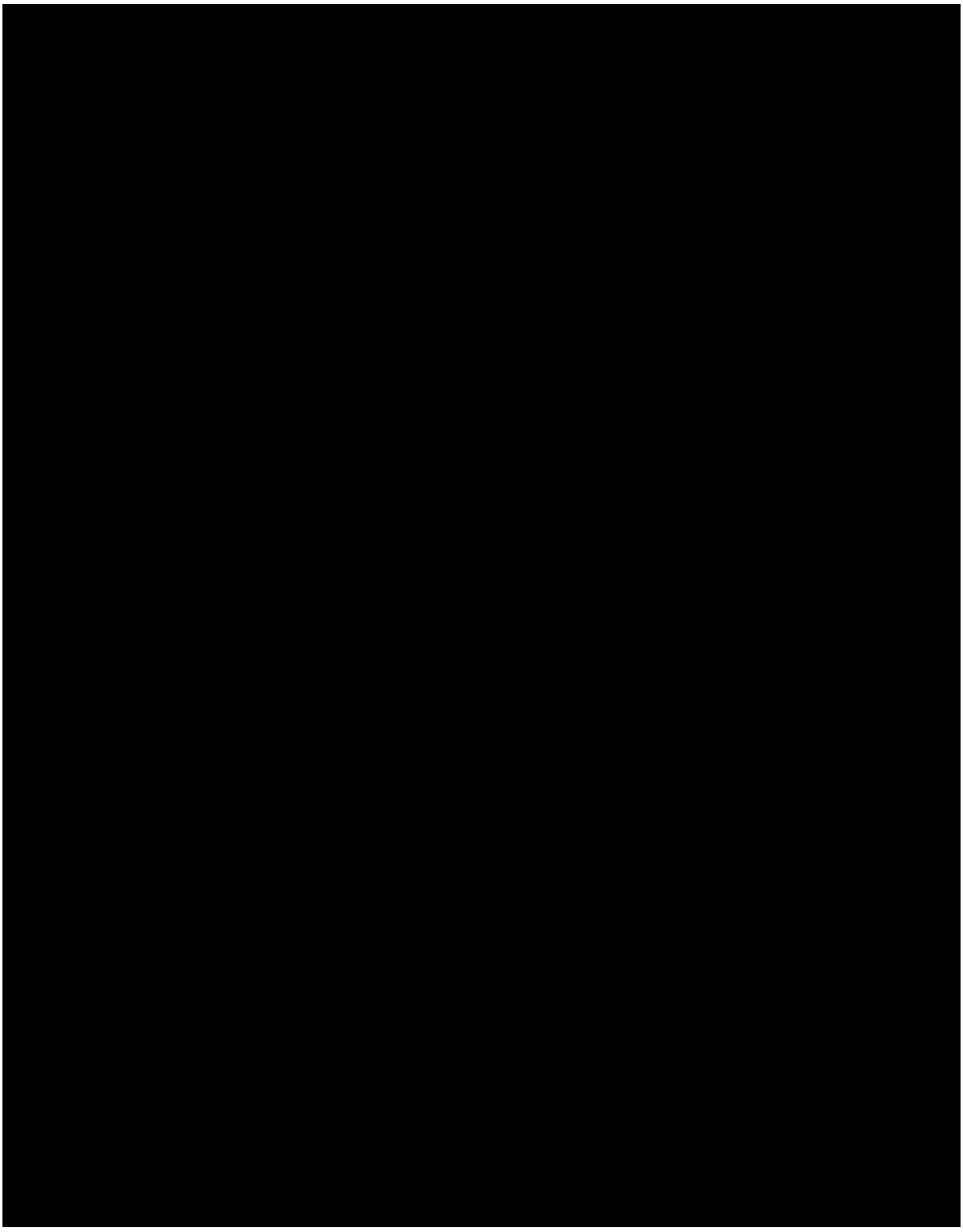

Figure 71: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of Survey Area 8.

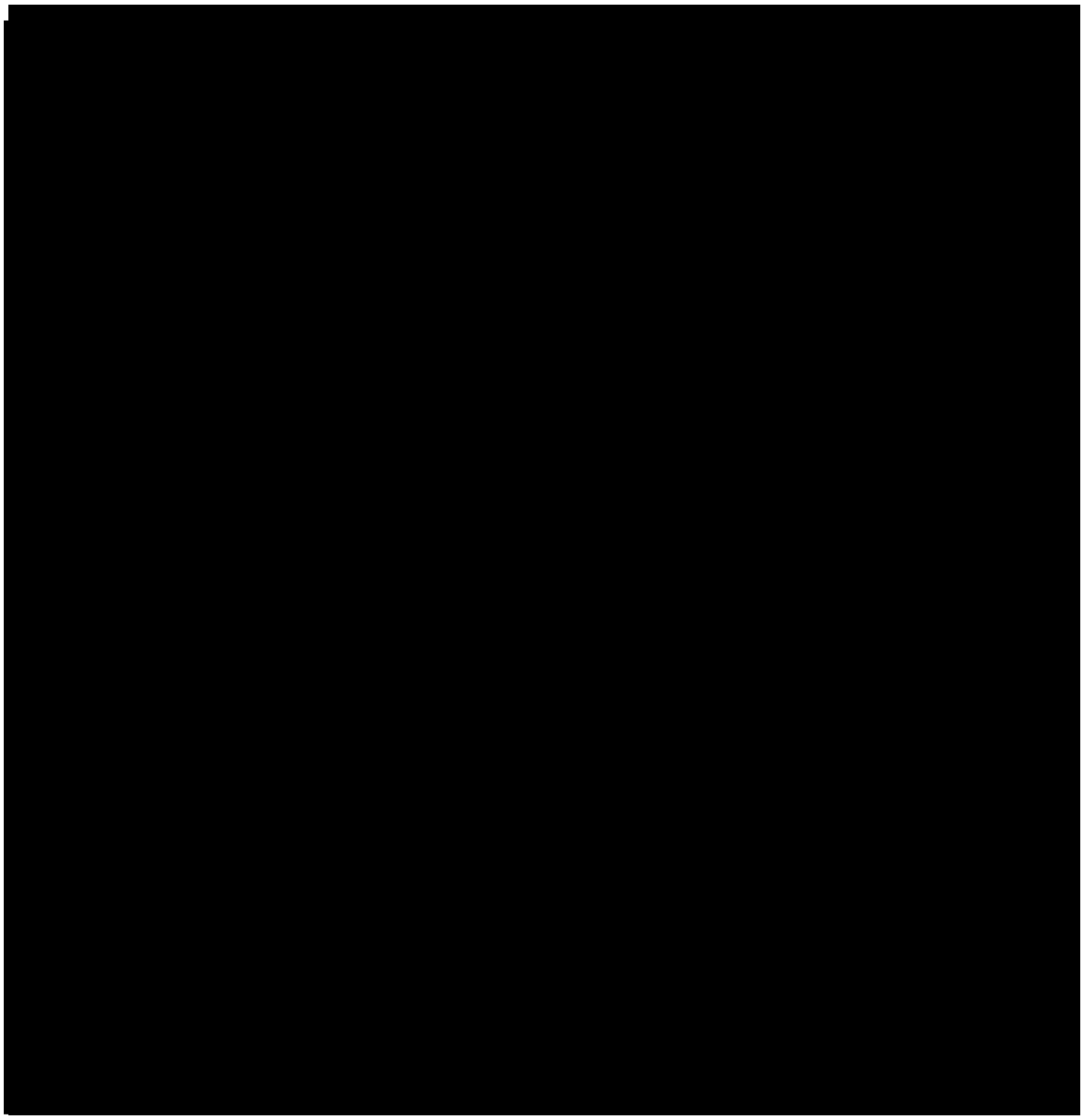

Figure 72: [redacted]

Artifacts

A total of four artifacts were encountered in Survey Area 8. Table 20 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 73. Artifacts are listed by individual site in Volume 2, Appendix E.

No prehistoric artifacts were recovered from the survey area.

Four historic artifacts were recovered from Survey Area 8 and all are diagnostic (Table 21). Chronologically expressed these items include plain Ironstone with Royal Arm Mark "J & G Meakin Hanley" recovered from site 12-Bn-139 which was manufactured between 1842 to 1930 (Stelle 2001:Chapter 1). Green glass recovered from site 12-Bn-137 was manufactured between the 1860s to present (Horn 2005:1). Clear glass recovered from sites 12-Bn-138 and 12-Bn-139 was manufactured between 1875 to present (IMACS 1992:473)

Table 20: Artifacts from Survey Area 8.

Prehistoric	No.	Historic	No.
		Ceramic, Ironstone	1
		Glass, Green	1
		Glass, Clear	2
Total	**0**	**Total**	**4**

Table 21: Historic Diagnostics from Survey Area 8.

Artifact Type	Site	Date Range	Citation
Ironstone with Royal Arm Mark "J & G Meakin Hanley"	12-Bn-139	1842-1930	Stelle 2001:Chapter I
Green glass	12-Bn-137	1860s to present	Horn 2005:1
Clear glass	12-Bn-138, 12-Bn-139	1875 to present	IMACS 1992:473

Figure 73: Representative historic artifacts from Survey Area 8 (Photo by Kiya Mullins, Ball State University).

Sites

Three archaeological sites, 12-Bn-137 to 12-Bn-139, were recorded in Survey Area 8 (Figure 74 and Figure 75). Summaries for the individual sites are contained in Volume 2, Appendix F. All three sites had diagnostic artifacts (12-Bn-137 to 12-Bn-139). Two sites were historic isolated finds (12-Bn-137 and 12-Bn-138) and one site was a historic scatter (12-Bn-139).

The three sites were discovered on end moraines and ground moraines (12-Bn-137, 12-Bn-138, and 12-Bn-139). One site (12-Bn-137) was located on Selma silty clay loam (Sh) soil. One site (12-Bn-138) was located on Barce loam (BdB2) soil. One site was located on multiple soil types. One site (12-Bn-139) was located on Selma silty clay loam (Sh) and Foresman silt loam (FoB2) soils.

The site types found in Survey Area 8 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places. Although Survey Area 8 is in the proximity of the Potawatomi Trail (see memorial in Figure 72), it cannot be determined if the two historic isolated finds (12-Bn-137 and 12-Bn-138) and one historic scatter (12-Bn-139) have any connection with the Potawatomi Trail.

Density

Survey Area 8 consisted of approximately 195.97 acres of end moraines and ground moraines. Within Survey Area 8, a density of one site per 65.32 acres occurred and sites covered 0.26 percent of the surface area.

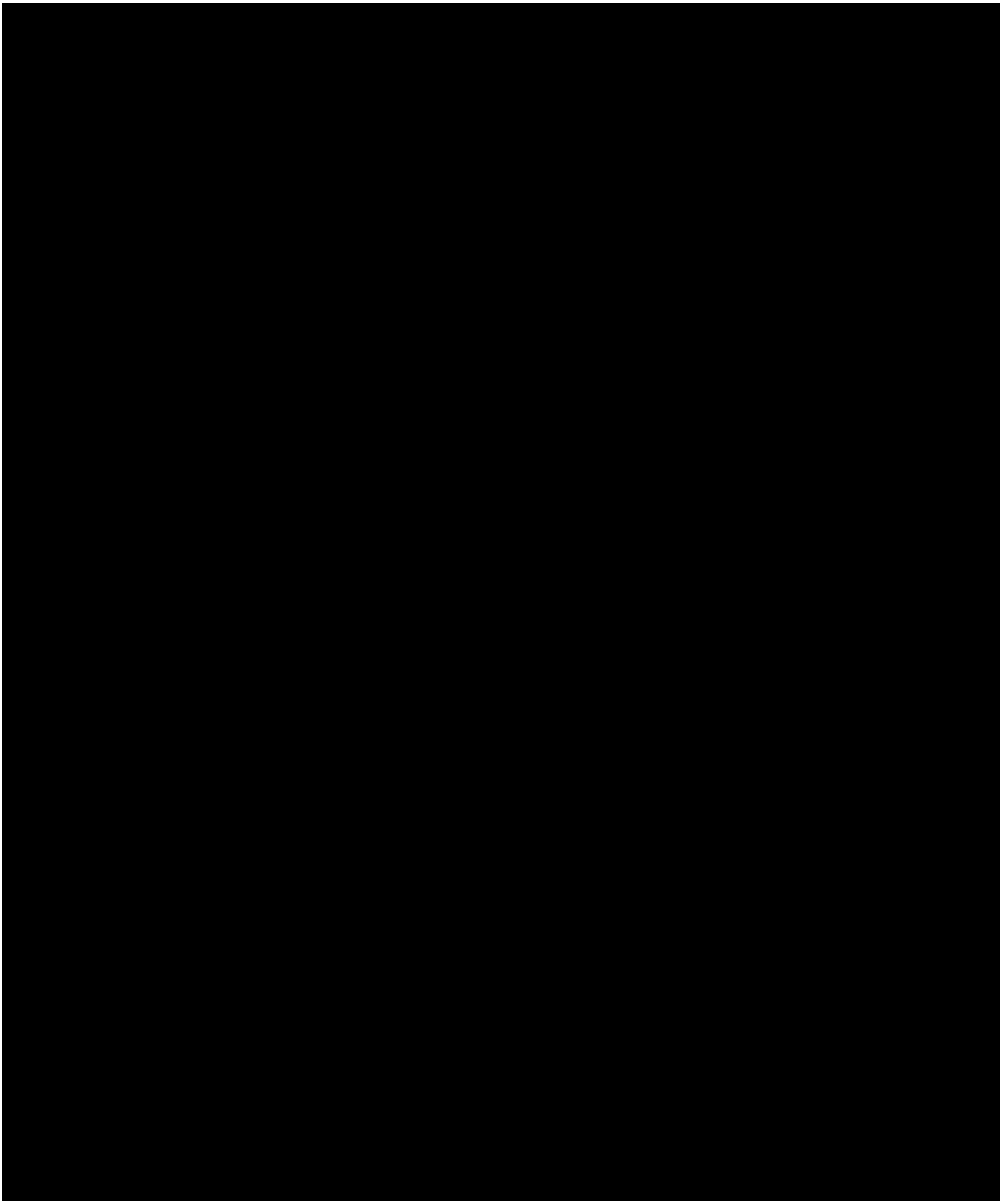

Figure 74: A portion of the USGS 7.5' Mount Gilboa, Indiana Quadrangle showing the location of sites 12-Bn-137 to 12-Bn-139.

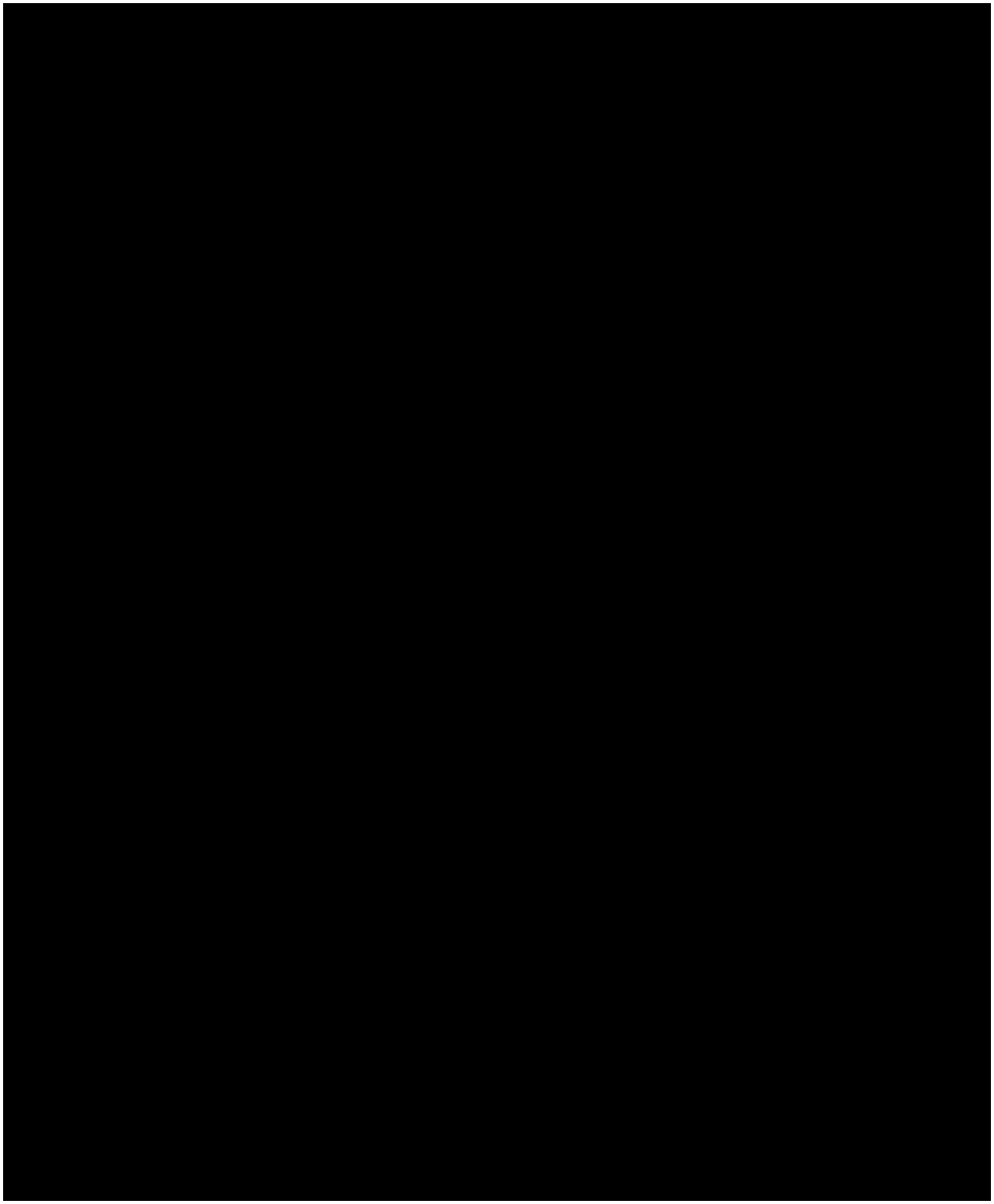

Figure 75: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-137 to 12-Bn-139.

Survey Area 9

Survey Area 9 was located in Pine Township in [redacted], Township 25 North, Range 6 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Round Grove Quadrangle (Figure 76 and Figure 77). The property was surveyed on August 7, 2015 and September 13, 2015. The field surveyed was still planted in corn that was standing between seven to 11 feet tall. Ground surface visibility was approximately 70 to 90 percent with small amounts of corn debris being the only visual obstacles. Approximately 105.85 acres were surveyed consisting of end moraines and ground moraines. The area contained Chalmers (Ch), Darroch (Do), Drummer (Du), Houghton (Ho), Miami (MlB2), Montomorenci (MxB2), Selma (Sh), and Whitaker (WoA) soils. Twenty-eight sites were encountered during the survey. The sites ranged in size from prehistoric and historic isolated finds to a historic scatter of 4,572.94 square meters (1.13 acres).

An Indiana Department of Highways survey (RS-4202) by DeRegnaucourt (1982) took place at the bridge juncture and intersection located adjacent to the north east corner of Survey Area 9. The survey was an archaeological reconnaissance project in preparation for the bridge replacement over [redacted], or [redacted] on [redacted] in Benton County (DeRegnaucourt 1982:2). The project area consisted of 500 feet (0.6 acres) of survey property and no archaeological remains were found (DeRegnaucourt 1982:3). In 1989, an addendum was made by Thomas Beard for a resurvey of the 1982 project area in preparation for bridge repair. No archaeological remains were found (Beard 1989) (Figure 78).

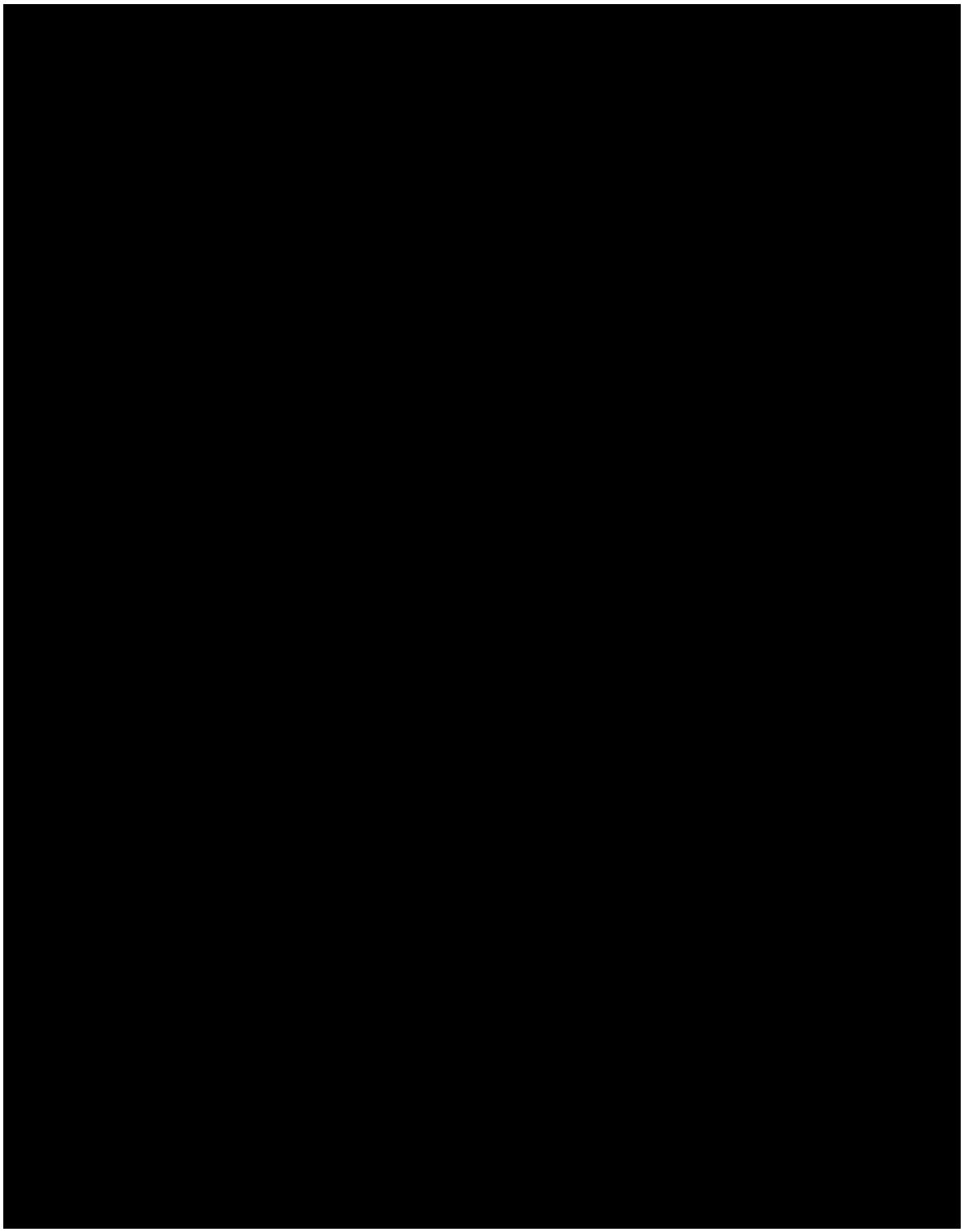

Figure 76: A portion of the map of Pine Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 9.

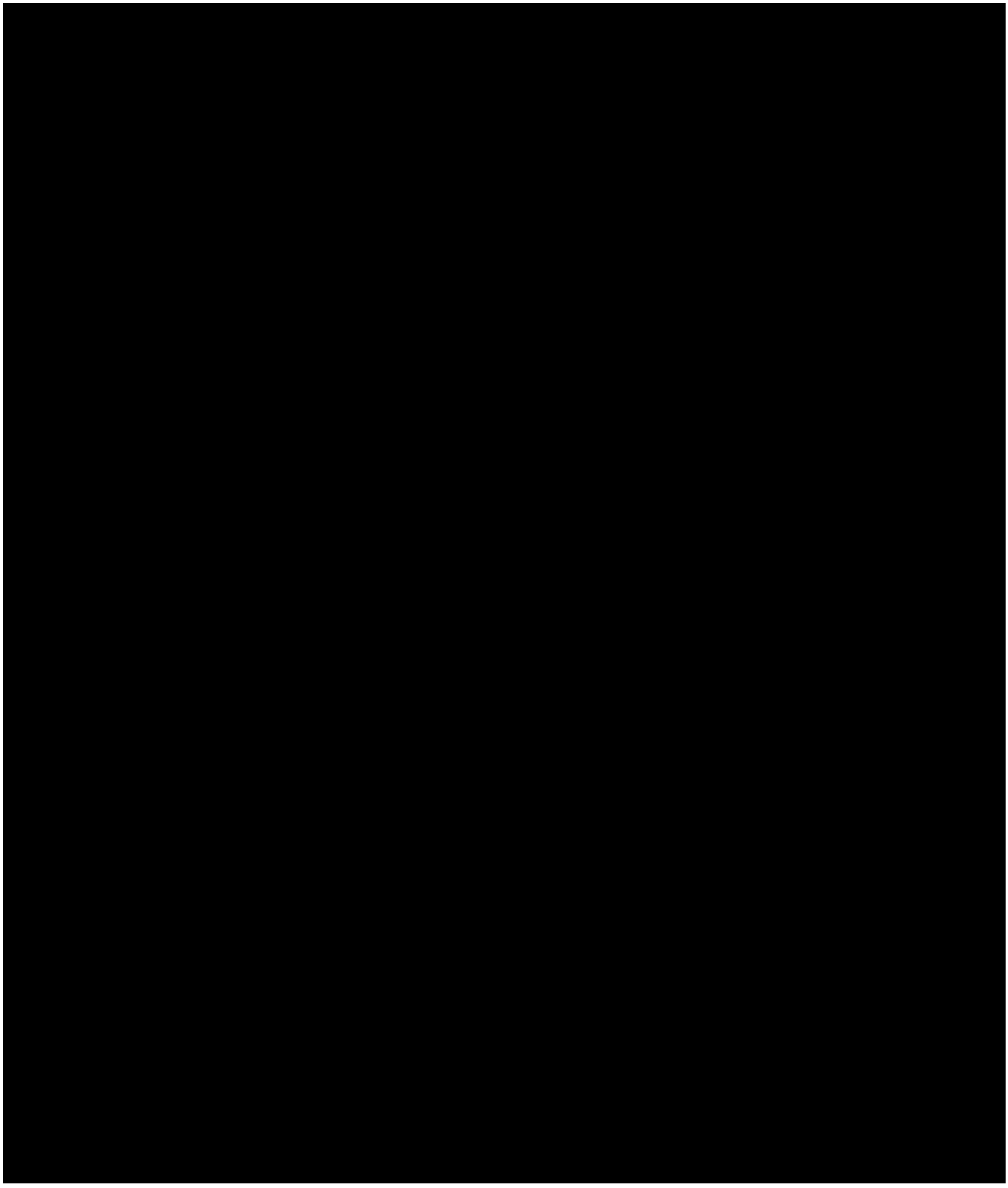

Figure 77: A portion of the USGS 7.5' Mount Gilboa, Indiana Quadrangle showing the location of Survey Area 9.

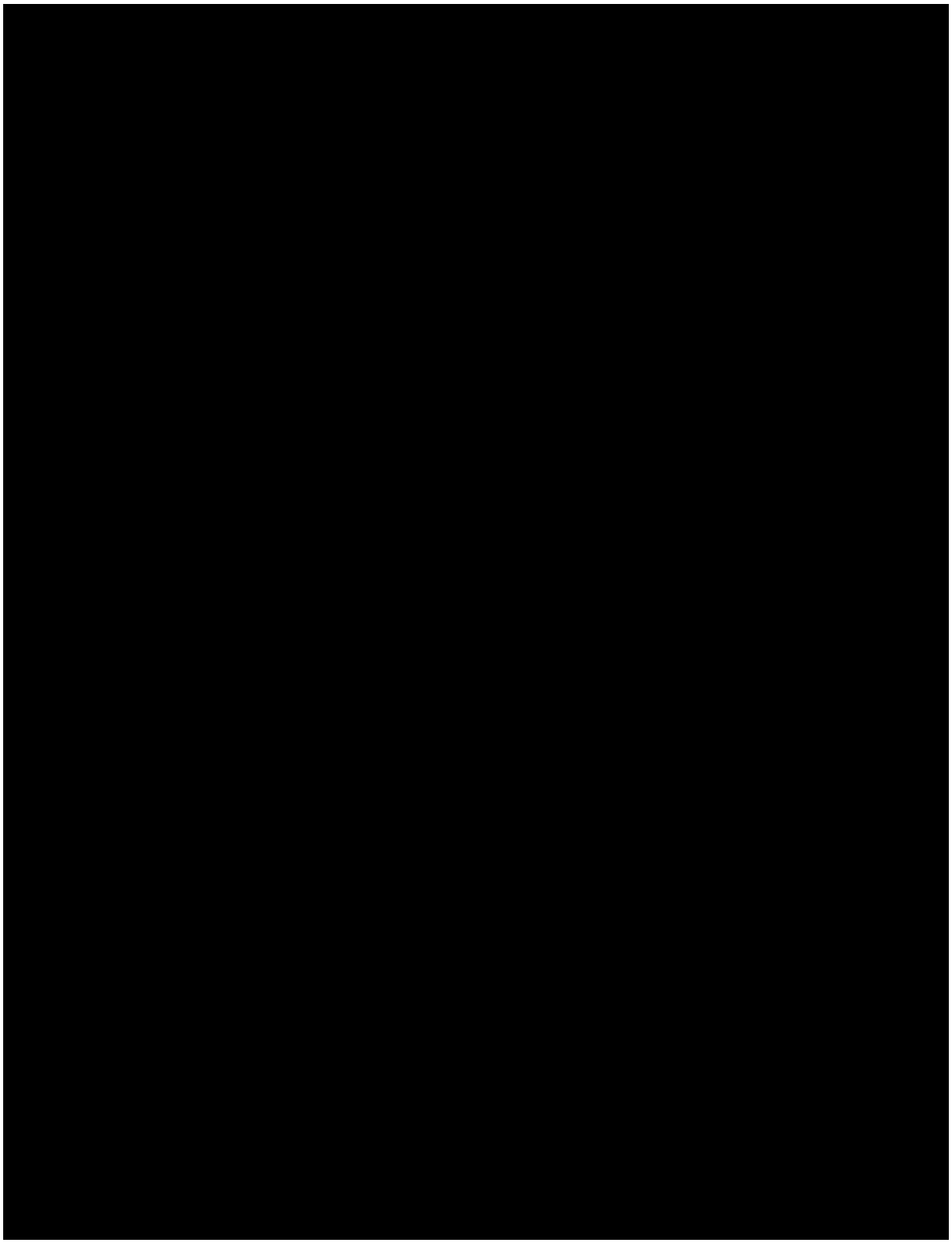

Figure 78: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of the 1982 and 1989 Project Area (Beard 1989; DeRegnaucourt 1982).

Artifacts

A total of 91 artifacts were encountered in Survey Area 9. Table 22 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 79 through Figure 85. Artifacts are listed by individual site in Volume 2, Appendix E.

Fifty-two prehistoric artifacts were recovered. Three diagnostic prehistoric artifacts were recovered in Survey Area 9. These artifacts included a possible Early Archaic Thebes Notched scraper from site 12-Bn-164 (Figure 79), a Late Archaic Brewerton Corner Notched heat treated biface from site 12-Bn-165 (Figure 80), and a terminal Middle Woodland to early Late Woodland Steuben Expanded hafted biface from site 12-Bn-152 (Figure 81).

Thirty-eight historic artifacts were recovered from Survey Area 5 and of those, 34 are diagnostic (Table 23). Chronologically expressed these items include aqua glass recovered from site 12-Bn-158 which was manufactured between 1800 to the 1920s (Horn 2005:1). Turquoise glass from site 12-Bn-157 was manufactured between 1800 to the 1920s (Horn 2005:1). Plain whiteware recovered from sites 12-Bn-156, 12-Bn-157, 12-Bn-162, and 12-Bn-167 was manufactured from 1820 to present (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and a Bristol glaze exterior recovered from sites 12-Bn-153, 12-Bn-156, and 12-Bn-158 was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Stoneware with Bristol glaze interior and exterior recovered from sites 12-Bn-153, 12-Bn-156, 12-Bn-157, and 12-Bn-161 was manufactured between 1835 to present (Stelle 2001:Chapter I). Plain ironstone recovered from sites 12-Bn-159 and 12-Bn-162 was manufactured between 1842 to 1930 (Miller 2000; Stelle 2001:Chapter I). Amber glass recovered from site 12-Bn-157 was manufactured between the 1860s to present (Horn 2005:1). Clear glass recovered from sites 12-Bn-157 and 12-Bn-162 was manufactured between 1875 to present (IMACS 1992:473). Amethyst glass recovered from site 12-Bn-162 was manufactured from 1885 to 1920 (Horn 2005:1). Stoneware with Albany glaze interior and exterior recovered from site 12-Bn-160 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and salt glaze exterior recovered from site 12-Bn-157 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with a salt glaze interior and exterior recovered from sites 12-Bn-160, 12-Bn-162, and 12-Bn-167 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I)

Table 22: Artifacts from Survey Area 9.

Prehistoric	No.	Historic	No.
Biface	6	Ceramic, Ironstone	3
Scraper	1	Ceramic, Whiteware	6
Core	7	Ceramic, Stoneware	16
Core, Fragment	1	Glass, Amber	1
Flake, Tool	1	Glass, Amethyst	1
Flake	7	Glass, Aqua	1
Flake, Medial	8	Glass, Clear	4
Flake, Distal	4	Glass, Green/Turquoise	2
Flake, Proximal	10	Iron	2
Flake, Shatter	5	Bone	2
Flake, Retouched	2		
Total	**52**	**Total**	**38**

Table 23: Historic Diagnostics from Survey Area 9.

Artifact Type	Site	Date Range	Citation
Aqua glass	12-Bn-158	1800-1920a	Horn 2005:1
Turquoise glass	12-Bn-157	1800-1920s	Horn 2005:1
Plain whiteware	12-Bn-156, 12-Bn-157, 12-Bn162, and 12-Bn-167	1820 to present	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and a Bristol glaze exterior	12-Bn-153, 12-Bn-156, and 12-Bn-158	1830-1940	Stelle 2001:Chapter I
Stoneware with Bristol glaze interior and exterior	12-Bn-153, 12-Bn-156, 12-Bn-157, and 12-Bn-158	1835 to present	Stelle 2001:Chapter I
Plain ironstone	12-Bn-169 and 12-Bn-162	1842-1930	Miller 2000; Stelle 2001:Chapter I
Amber glass	12-Bn-157	1860s to present	Horn 2005:1
Clear glass	12-Bn-157, 12-Bn-162	1875 to present	IMACS 1992:473
Amethyst glass	12-Bn-162	1885-1920	Horn 2005:1
Stoneware with Albany glaze interior and exterior	12-Bn-160	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and salt glaze exterior	12-Bn-157	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with a salt glaze interior and exterior	12-Bn-160, 12-Bn-162, and 12-Bn-167	Termination date of 1940	Stelle 2001:Chapter I

Figure 79: A possible Early Archaic Thebes Notched scraper from site 12-Bn-164 (Photo by Kiya Mullins, Ball State University).

Figure 80: A Late Archaic Brewerton Corner Notched heat treated biface from site 12-Bn-165 (Photo by Kiya Mullins, Ball State University).

Figure 81: A terminal Middle Woodland to early Late Woodland Steuben Expanded hafted biface from site 12-Bn-152 (Photo by Kiya Mullins, Ball State University).

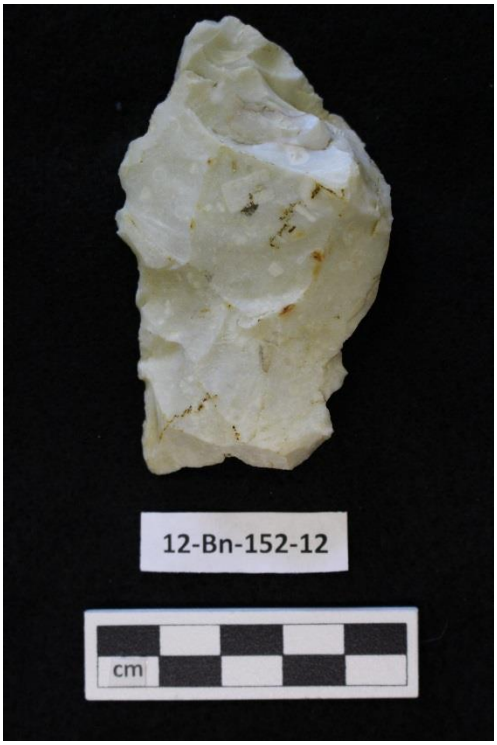

Figure 82: A nondiagnostic flake with early Ordovician Ostracod fossils from site 12-Bn-152 (Photo by Kiya Mullins, Ball State University).

Figure 83: Representative historic ceramic artifacts from Survey Area 9 (Photo by Kiya Mullins, Ball State University).

Figure 84: Representative historic glass from Survey Area 9 (Photo by Kiya Mullins, Ball State University).

Figure 85: Historic iron artifacts from Survey Area 9 (Photo by Kiya Mullins, Ball State University).

Sites

Twenty-eight archaeological sites, 12-Bn-140 to 12-Bn-167, were recorded in Survey Area 9 (Figure 86 and Figure 87). Summaries for the individual sites are contained in Volume 2, Appendix F. Thirteen sites had diagnostic artifacts (12-Bn-140, 12-Bn-152, 12-Bn-156 to 12-Bn-162, and 12-Bn-164 to 12-Bn-167). Seven of the sites were prehistoric isolated finds (12-Bn-143, 12-Bn-147, 12-Bn-149, 12-Bn-150, 12-Bn-153, 12-Bn-154, and 12-Bn-163) and eight sites were lithic scatters (12-Bn-142, 12-Bn-144, 12-Bn-145, 12-Bn-146, 12-Bn-148, 12-Bn-151, 12-Bn-164, and 12-Bn-165). Five sites were historic isolated finds (12-Bn-140, 12-Bn-141, 12-Bn-155, 12-Bn-161, and 12-Bn-167). Four sites were historic scatters (12-Bn-156, 12-Bn-157, 12-Bn-158, and 12-Bn-160). Four sites (12-Bn-152, 12-Bn-159, 12-Bn-162, and 12-Bn-166) were multicomponent sites. Two were lithic and historic scatters (12-Bn-152 and 12-Bn-162). One site (12-Bn-159) was a lithic scatter and a historic isolate and one site (12-Bn-166) was a prehistoric isolate and historic isolate.

All twenty-eight sites (12-Bn-140 to 12-Bn-167) were discovered on end moraines and ground moraines. One site (12-Bn-140) was found on Darroch silt loam (Do) soil. Two sites (12-Bn-143 and 12-Bn-155) were found on Chalmers silty clay loam (Ch) soil. One site (12-Bn-154) was found on Montmorenci silt loam (MxB2) soil. One site (12-Bn-156) was found on Selma silty clay loam (Sh) soil. Seventeen sites (12-Bn-142, 12-Bn-144 to 12-Bn-147, 12-Bn-149 to 12-Bn-153, 12-Bn-158, 12-Bn-160 to 12-Bn-165, and 12-Bn-167) were found on Miami silt loam (MlB2) soil. One site was found on Whitaker silt loam (WoA) soil (12-Bn-148). Six sites were found on multiple soil types. One site (12-Bn-141) was found on Chalmers silty clay loam (Ch) and Whitaker silt loam (WoA) soils. One site (12-Bn-157) was found on Miami silt loam (MlB2) and Selma silty clay loam (Sh) soils. One site (12-Bn- 166) was found on Chalmers silty clay loam (Ch) and Miami silt loam (MlB2) soils. One site (12-Bn-159) was found on Houghton muck (Ho) and Miami silt loam (MlB2) soils.

Due to 63.16 percent (n=24) of all historic artifacts recovered (sites 12-Bn-152, 12-Bn-155 to 12-Bn-158, and 12-Bn-161) being concentrated in the southern half of Survey Area 9, three historic maps were consulted. No historic structures were noted within Survey Area 9 (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:47). No evidence of sub-surface features or structures were encountered. With the nearest historic structure located 29.01 meters (95.18 ft.) south, it appears that sites 12-Bn-152, 12-Bn-155 to 12-Bn-158, and 12-Bn-161 were proximal historic dump sites, rather than primary deposits. Based on the archaeological evidence and our historic research, it does not appear that 12-Bn-152, 12-Bn-155 to 12-Bn-158, and 12-Bn-161 have the potential to yield additional information beyond the Phase I level.

Survey Area 9 is comprised of gently sloping rises of 5 to 15 feet consisting of Miami silt loam, a well-drained alfisol, surrounded by Chalmers silt clay loam and Houghton Muck

both poorly drained soils (Barnes 1989:25, 45, 48; Figure 88). Sites 12-Bn-152, 12-Bn-164, 12-Bn-165 are all located on these rises of Miami silt loam. Eighty-four percent (n=16) of sites with a prehistoric component, including 12-Bn-152, 12-Bn-164, and 12-Bn-165, are located on the rises of Miami silt loam soil, suggesting that the people were focusing on the elevated well-drained soils. The combination of rich silt loam and poorly drained silt clay loam created a unique micro-ecology displaying a diversity of soil and biotic resources. The presence of Miami interspersed with Chalmers and Houghton within a relatively small area presents a unique concentration of past environments for Benton County (see Figure 16), indicating that the micro-ecology resulting from these soils created an appealing landscape. Occupation of similar microenvironments and subtle topographic rises has been documented in other counties in northwestern Indiana. Surface-Evans (2015:186) conducted research on wetland use focusing on the Kankakee marsh. The results of Surface-Evans and the FY2015 HPF Grant project in Newton County (Leeuwrik et al. 2016) supported the human exploitation of rise of well-drained soils surrounded by poorly drained wetland soils, creating a micro-ecology conducive to biotic diversity. In Newton County, this trend is expressed in the occupation of the rich oak-hickory soils on the sand islands, located in the northern half of the county (Leeuwrik et al. 2016). Sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 on Survey Area 9 are the best representatives of this trend.

Of the thirteen different chert types identified in Survey Area 9, 76.92 percent (n=10) are located on the rises. Burlington, Derby, Laurel, Liston Creek, Holland, Muldraugh, and Wyandotte, which have chert sources in Illinois and southern Indiana, were found only on the rises. Flint Ridge, a chert from Ohio, was found only in the low areas. Lost River and Jeffersonville, with chert sources found southern Indiana, were found only on the low areas. Attica and Kenneth cherts, both with sources located the close to Benton County, were found on and off the rises. Survey Area 9 contains 65 percent (n=52) of all lithic materials found during the current investigation. Survey Area 9 is the only survey area to display Attica, Blanding, Flint Ridge, Lost River, Muldraugh, and Wyandotte cherts. These chert types have no outcrop near Benton County, with the exception of Attica chert located 35 km to the south. The presence of these exotic cherts suggests a more formal use of the landscape for activities such as formal lithic reduction, habitation, and chert trading.

Sites 12-Bn-152, 12-Bn-164, and 12-Bn- 165 exhibit evidence of primary reduction and exotic trade. Site 12-Bn-152 was a prehistoric and historic scatter, containing a terminal Middle Woodland to early Late Woodland Steuben Expanded hafted biface, consistent with Attica chert (Figure 81), twelve other lithic artifacts, and three historic artifacts. Site 12-Bn-164 was a prehistoric lithic scatter consisting of a possible Early Archaic Thebes Notched scraper, consistent with Wyandotte chert (Figure 79) and a proximal flake consistent with Laurel chert. Site 12-Bn-165 was a 2063.89 square meters (0.51 acres) lithic scatter containing a Late Archaic Brewerton Corner Notched heat treated biface, consistent with Muldraugh chert (Figure

80), and three other prehistoric flakes. As stated above, sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 were all discovered on rises of Miami silt loam. Survey Area 9 was the only survey area that exhibited this pattern of landscape exploitation and should be considered as a potential location of resurvey for future investigations.

Based on the artifact assemblages, the soil context, and the possible unique micro-ecology, sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 have the potential to yield additional information beyond the Phase I level. Viewed together, these sites exhibit a pattern of landscape usage based on the location of these sites on small areas of well drained soils within a larger poorly drained area characterized by wet prairie environments or ponds. Individually sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 do not seem to be eligible under Criteria D; however, as a group they illustrate a pattern of behavior (a type of environmental exploitation strategy) that represents an important trend in prehistoric interaction with and exploitation of the wetlands of northwest Indiana. Therefore sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 may be eligible for listing on the Indiana Register of Historic sites under Criteria C (i.e., the site (s) represent a significant and distinguishable entity whose components may lack individual distinction [National Park Service 2014]). Sites and adjacent contextual areas should be an item of further investigation.

Due to the low density of artifacts, all other site types in Survey Area 9 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 9 consisted of approximately 105.85 acres consisting of end moraines and ground moraines. Within Survey Area 9, a density of one site per 3.78 acres occurred and sites covered 6.76 percent of the surface area.

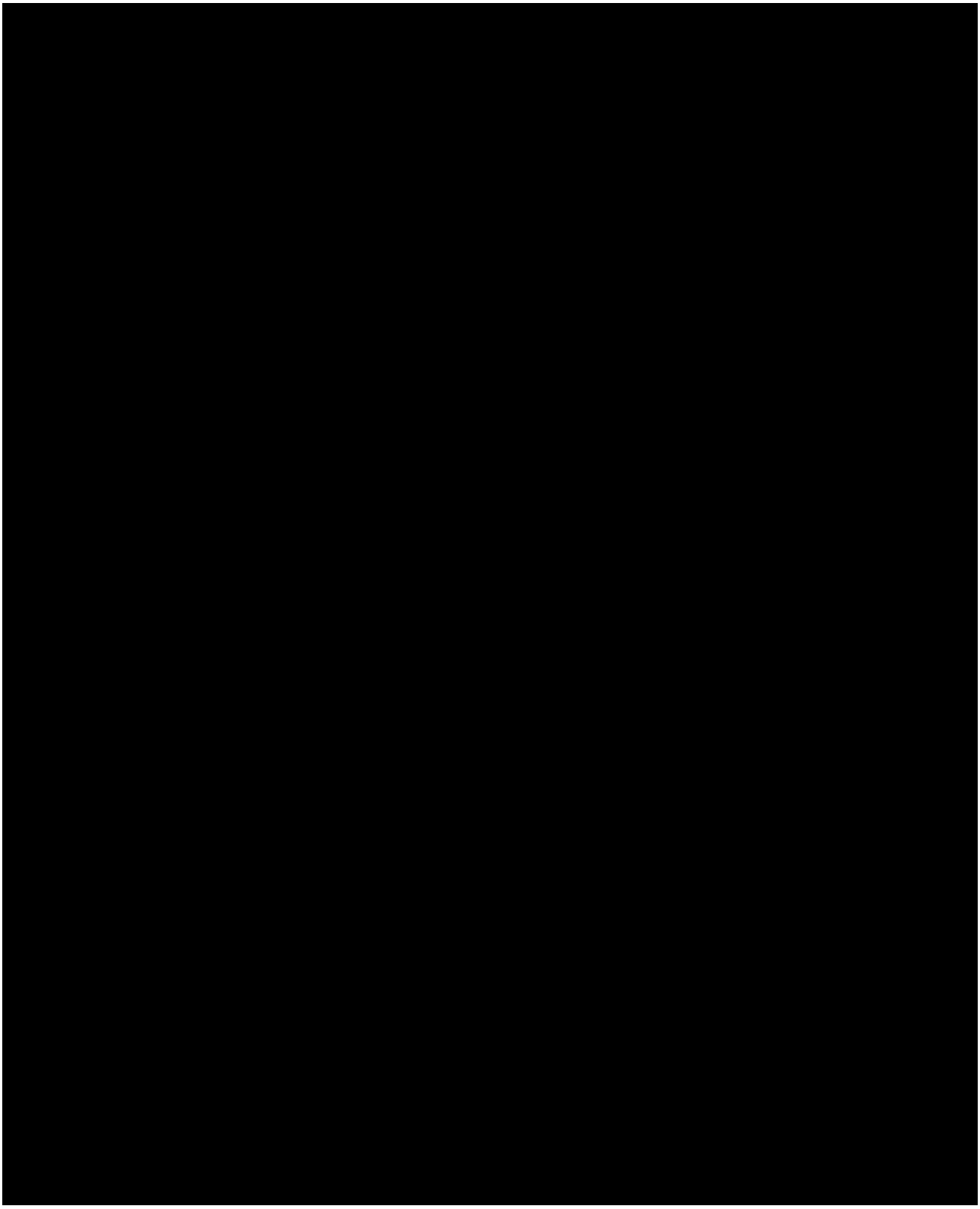

Figure 86: A portion of the USGS 7.5' Round Grove, Indiana Quadrangle showing the location of sites 12-Bn-140 to 12-Bn-167.

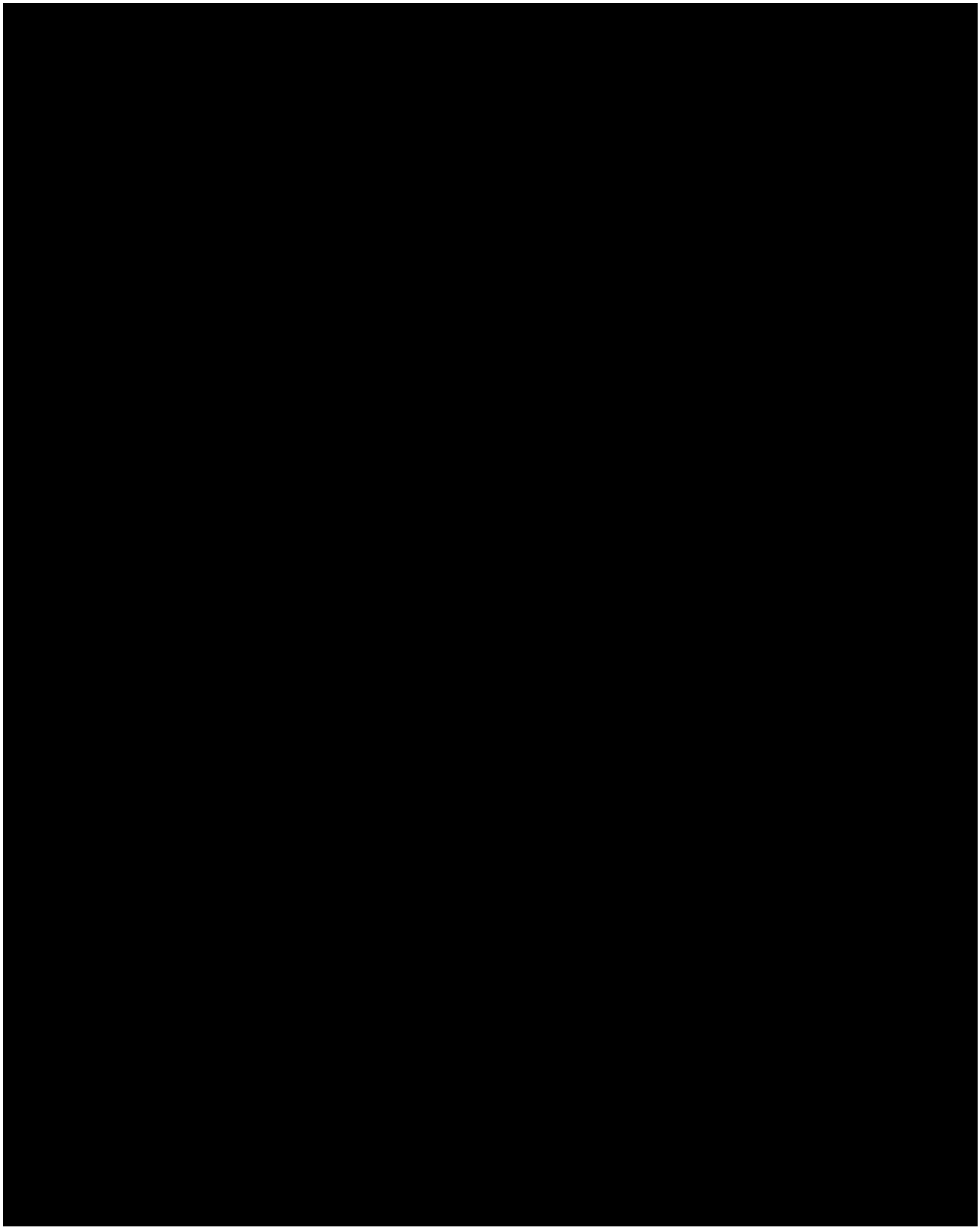

Figure 87: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-140 to 12-Bn-167.

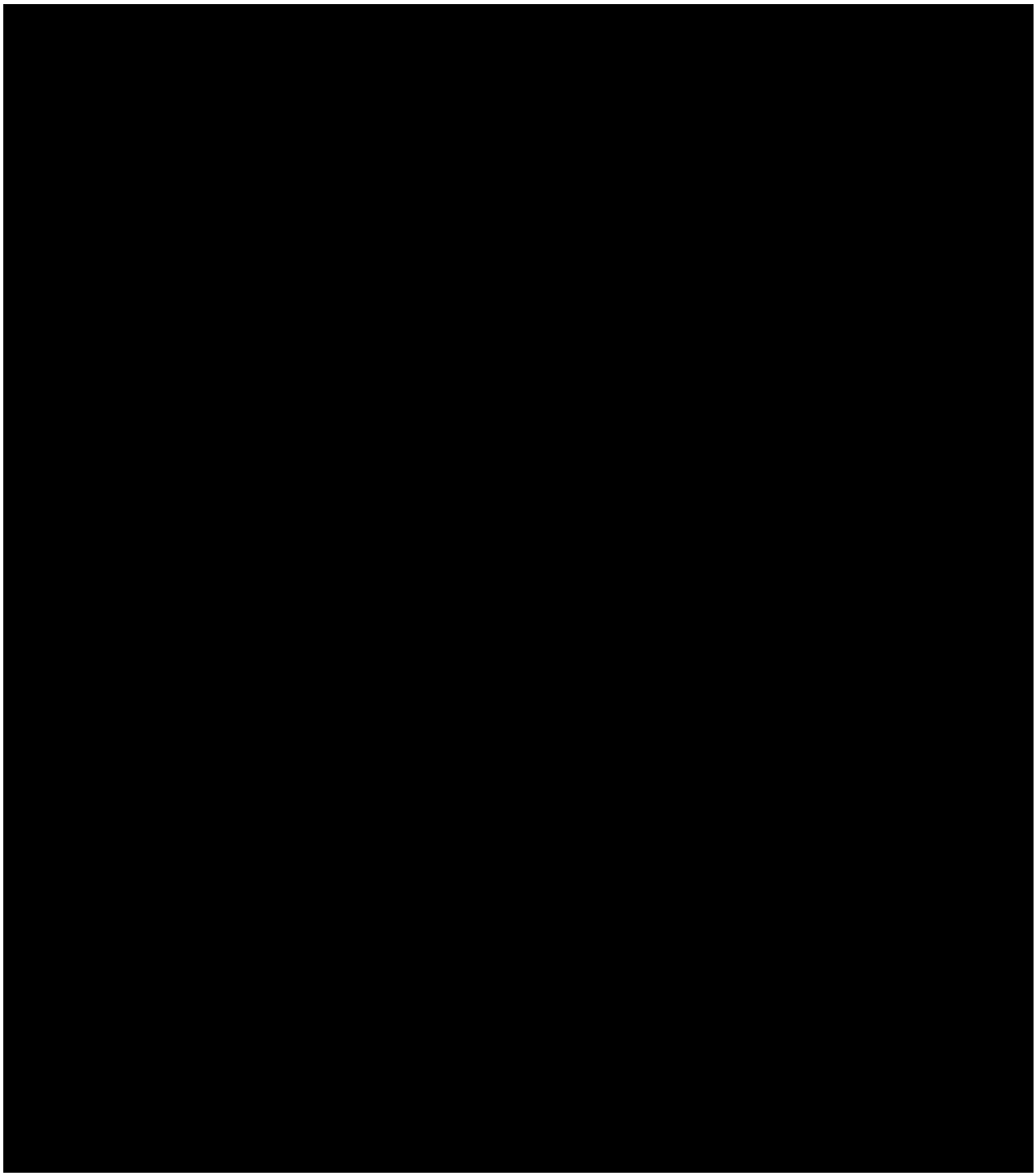

Figure 88: Soil Orders and Artifact Locations within Survey Area 9 (Soil Survey Staff 2013). Artifacts represented by red dots.

Survey Area 10

Survey Area 10 was located in Wadena Township in [redacted] Township 26 North, Range 9 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Earl Park, Indiana Quadrangle (Figure 89 and Figure 90). The property was surveyed on September 13, 2015. The field surveyed was still planted in corn that was standing between seven to 11 feet tall. Ground surface visibility was approximately 80 to 90 percent with small amounts of corn debris hindering visibility. Approximately 37.06 acres were surveyed consisting of end moraines. The area contained Chalmers (Ch), Corwin (CsA and CsB2), Drummer (Du and Dx), Gilboa (GlA and GlB), Montmorenci (MxB2), Odell (OlA and OlB2), and Wea (WhA) soils. Eleven sites were encountered during the survey (12-Bn-168 to 12-Bn-178). The sites ranged in size from prehistoric and historic isolated finds to a historic scatter of 2,225.77 square meters (0.55 acres).

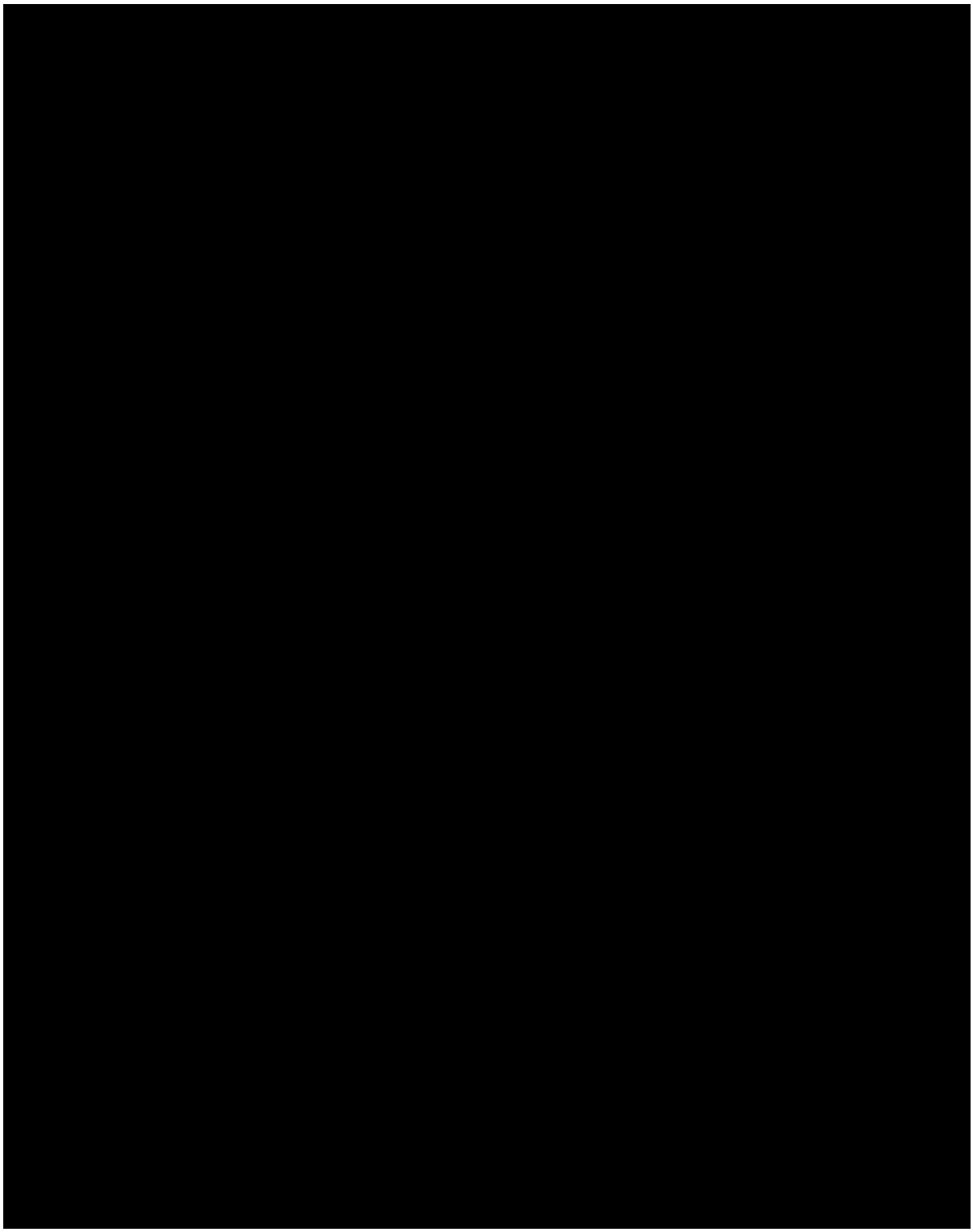

Figure 89: A portion of the map of Wadena Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 10.

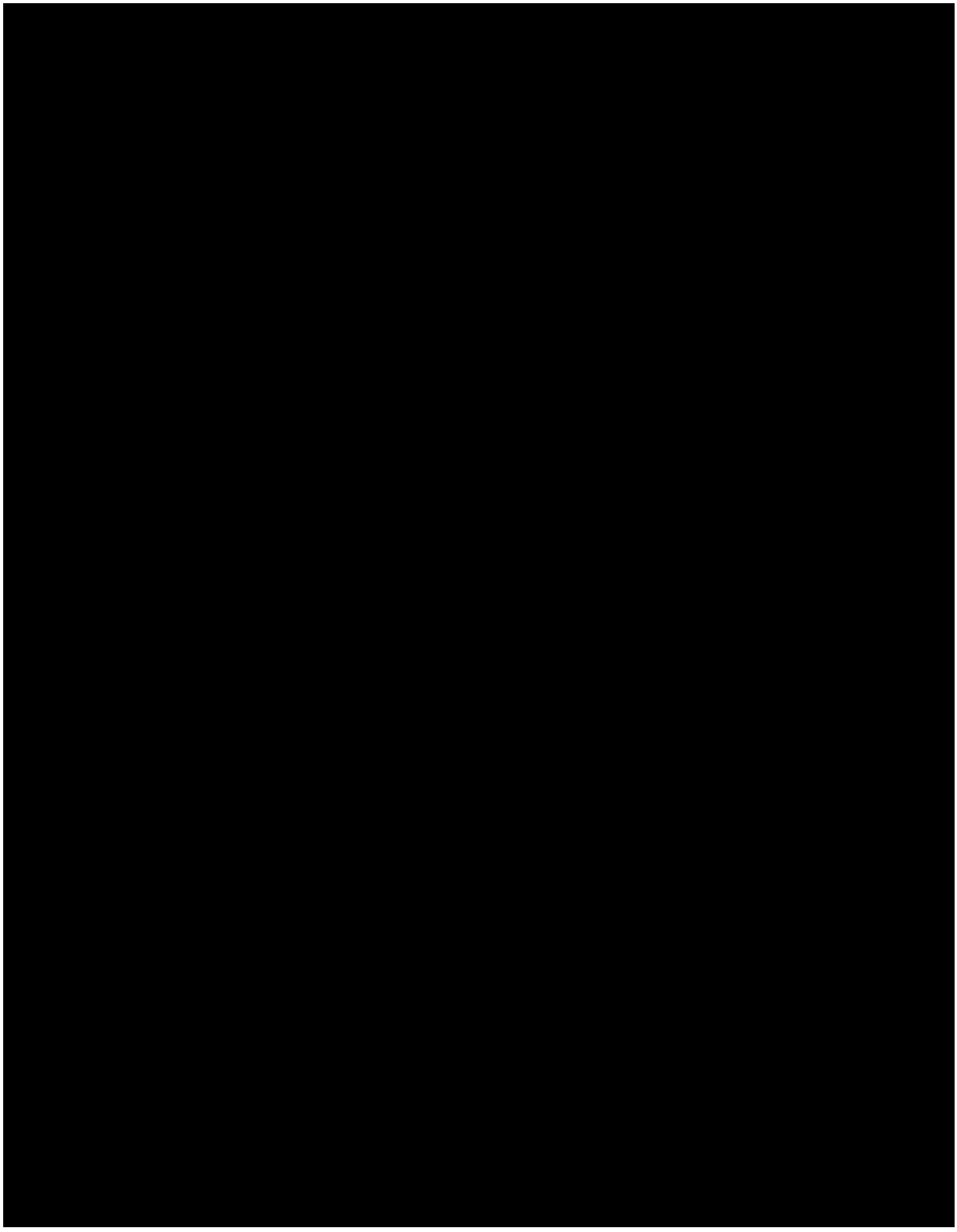

Figure 90: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of Survey Area 10.

Artifacts

A total of 71 artifacts were encountered in Survey Area 10. Table 24 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 91 through Figure 94. Artifacts are listed by individual site in Volume 2, Appendix E.

Two prehistoric artifacts were recovered. No diagnostic prehistoric artifact was recovered from Survey Area 10 (Figure 91).

Sixty-nine historic artifacts were recovered from Survey Area 10 and of those, 63 are diagnostic (Table 25). Chronologically expressed these items include aqua glass recovered from sites 12-Bn-172 and 12-Bn-177 which was manufactured between 1800 to the 1920s (Horn 2005:1). Plain whiteware recovered from sites 12-Bn-170, 12-Bn-171, 12-Bn-175, and 12-Bn-178 was manufactured from 1820 to present (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and a Bristol glaze exterior recovered from site 12-Bn-178 was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Stoneware with Bristol glaze interior and exterior recovered from site 12-Bn-178 was manufactured between 1835 to present (Stelle 2001:Chapter 1).Amber glass recovered from sites 12-Bn-169 and 12-Bn-178 was manufactured between the 1860s to present (Horn 2005:1). Clear glass recovered from sites 12-Bn-175, 12-Bn-176 and 12-Bn-178 was manufactured between 1875 to present (IMACS 1992:473). Amethyst glass recovered from site 12-Bn-178 was manufactured from 1885 to 1920 (Horn 2005:1). Stoneware with Albany glaze interior and exterior recovered from site 12-Bn-178 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and salt glaze exterior recovered from site 12-Bn-178 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with a salt glaze interior and exterior recovered from sites 12-Bn-168 and 12-Bn-178 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I)

Table 24: Artifacts from Survey Area 10.

Prehistoric	No.	Historic	No.
Flake, Proximal	1	Ceramic, Whiteware	4
Flake, Distal	1	Ceramic, Stoneware	35
		Glass, Amber	2
		Glass, Amethyst	1
		Glass, Aqua	4
		Glass, Clear	14
		Copper, Shotshell	1
		Iron, Handle	1
		Iron, Screw and Washer	1
		Iron	2
		Brick (not collected)	4
Total	**2**	**Total**	**69**

Table 25: Historic Diagnostics from Survey Area 10.

Artifact Type	Site	Date Range	Citation
Aqua glass	12-Bn-172, 12-Bn-177	1800-1920s	Horn 2005:1
Plain whiteware	12-Bn-170, 12-Bn-175, and 12-Bn-178	1820 to present	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and a Bristol glaze exterior	12-Bn-178	1830-1940	Stelle 2001:ChapterI
Stoneware with Bristol glaze interior and exterior	12-Bn-178	1835 to present	Stelle 2001:Chapter I
Amber glass	12-Bn-169, 12-Bn-178	1860s to present	Horn 2005:1
Clear glass	12-Bn-175, 12-Bn-176, and 12-Bn-178	1875 to present	IMACS 1992:473
Amethyst glass	12-Bn-178	1885-1920	Horn 2005:1
Stoneware with Albany glaze interior and exterior	12-Bn-178	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and salt glaze exterior	12-Bn-178	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with a salt glaze interior and exterior	12-Bn-168, 12-Bn-178	Termination date of 1940	Stelle 2001:Chapter I

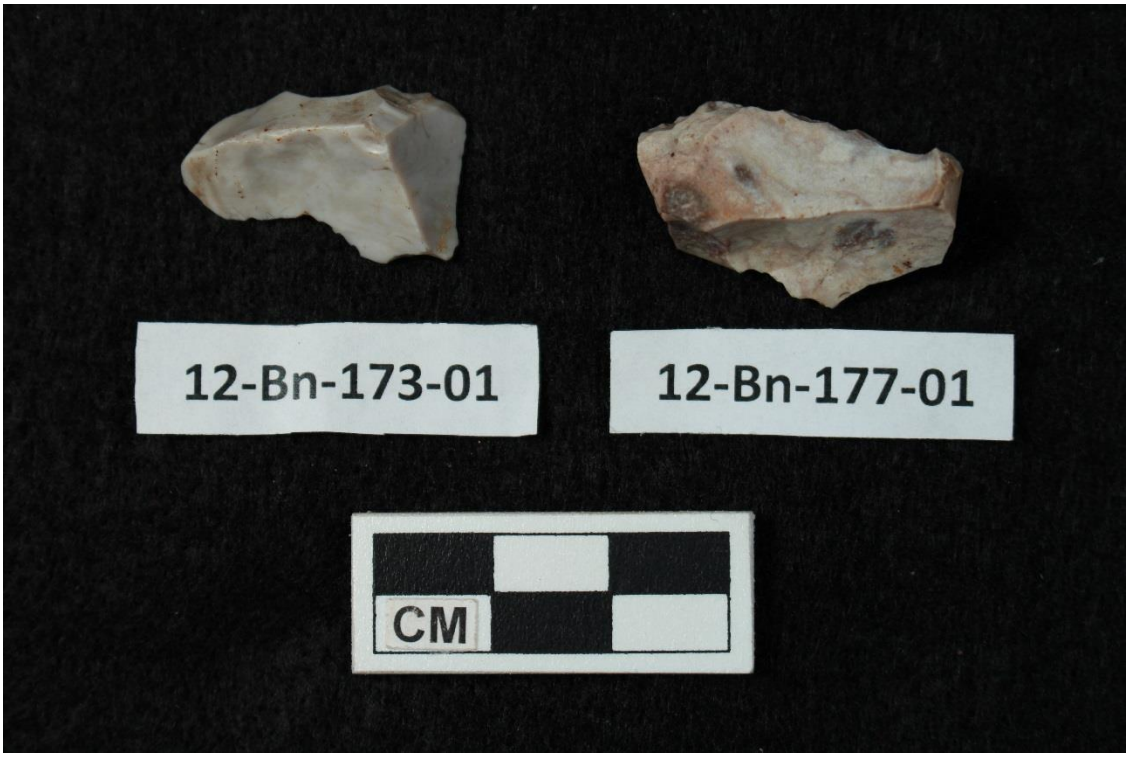

Figure 91: Representative prehistoric artifacts from Survey Area 10 (Photo by Kiya Mullins, Ball State University).

Figure 92: Representative historic ceramic artifacts from site 12-Bn-178 (Photo by Kiya Mullins, Ball State University).

Figure 93: Representative historic glass artifacts from sites 12-Bn-176 and 12-Bn-178 (Photo by Kiya Mullins, Ball State University).

Figure 94: Representative historic iron artifacts from sites 12-Bn-174 and 12-Bn-178 (Photo by Kiya Mullins, Ball State University).

Sites

Eleven archaeological sites, 12-Bn-168 to 12-Bn-178, were recorded in Survey Area 10 (Figure 95 and Figure 96). Summaries for the individual sites are contained in Volume 2, Appendix F. Nine sites had diagnostic artifacts (12-Bn-168 to 12-Bn-172, 12-Bn-175 to 12-Bn-178). Seven sites were historic isolated finds (12-Bn-168, 12-Bn-169 to 12-Bn-172, 12-Bn-174, and 12-Bn-176). One of the sites was a prehistoric isolated find (12-Bn-173). Two sites were historic scatters (12-Bn-175 and 12-Bn-178).One site (12-Bn-177) was a multicomponent site with a prehistoric isolate and a historic isolate.

All 11 sites were discovered on end moraines (12-Bn-179 to 12-Bn-186). Two sites (12-Bn-168 and 12-Bn-174) was found on Corwin silt loam (CsB2) soil. Four sites (12-Bn-170, 12-Bn-175 to 12-Bn-177) were found on Gilboa silt loam (GlB) soil. Two sites (12-Bn-171 and 12-Bn-173) were found on Montmorenci silt loam (MxB2) soil. Six sites were found on multiple soil types. One site (12-Bn-169) was found on Chalmers silty clay loam (Ch) and Gilboa silt

loam (GlB) soils. One site (12-Bn-172) was found on Chalmers silty clay loam (Ch) and Odell silt loam (OlA) soils. One site (12-Bn-178) was found on Corwin silt loam (CsB2) and Gilboa silt loam (GlB) soils.

Site 12-Bn-178, located on the eastern boundary of Survey Area 10, was a historic scatter of 2,225.771 square meters (0.55 acres) consisting of 56 historic artifacts. Due to the presence of 12-Bn-178 and the potential for a historic structure, three historic maps were consulted and no historic structures were noted within this site (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:47). With the nearest historic structure located 173.56 meters east (569.42 ft), it appears that 12-Bn-178 was a proximal historic dump site, rather than primary deposits. Based on the archaeological evidence and our historic research, it does not appear that 12-Bn-178 has the potential to yield additional information beyond the Phase I level.

12-Bn-178 and all other site types in Survey Area 1 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places

Density

Survey Area 10 consisted of approximately 37.06 acres of end moraines. Within Survey Area 10, a density of one site per 3.37 acres occurred and sites covered 6.66 percent of the surface area.

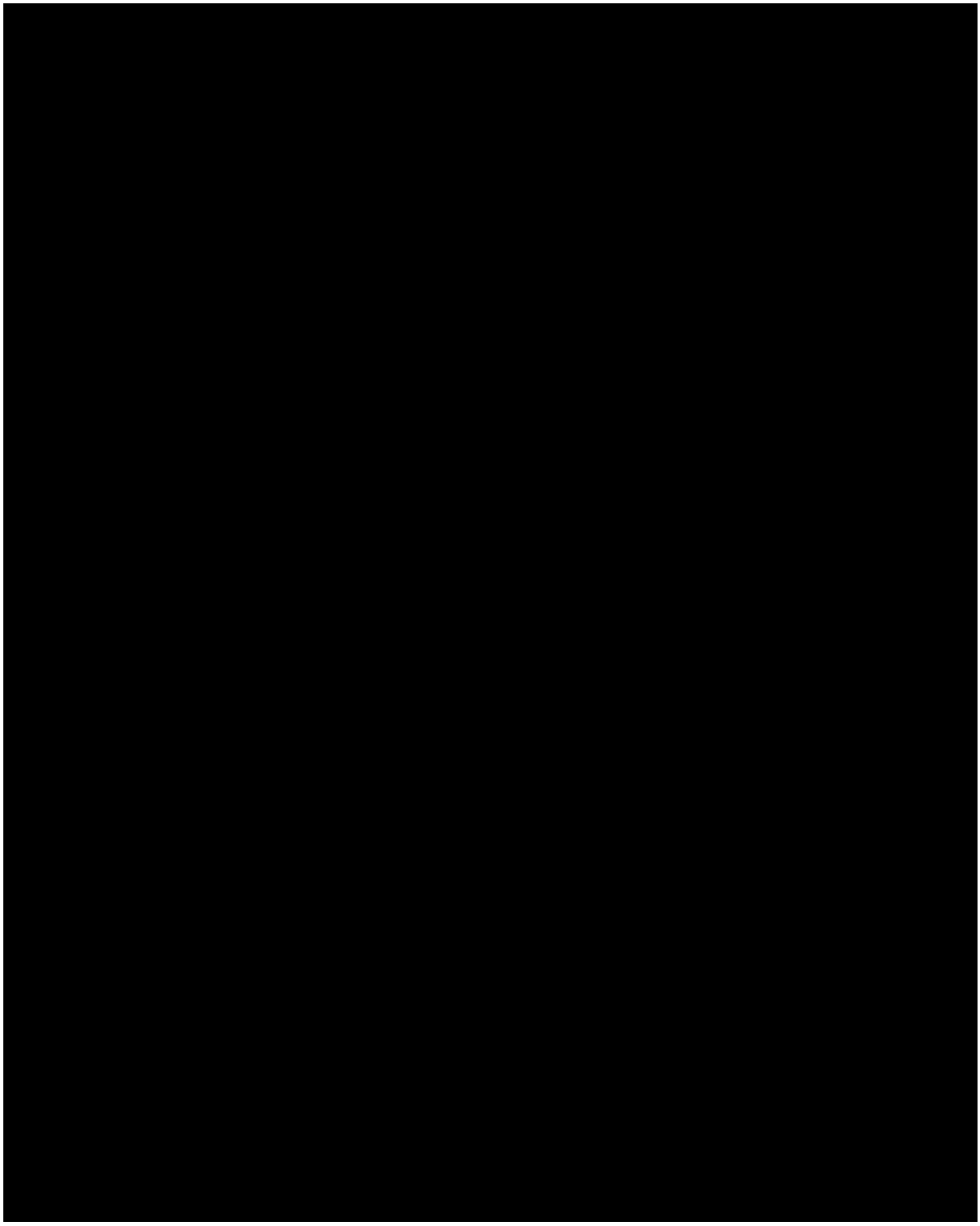

Figure 95: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of sites 12-Bn-168 to 12-Bn-178.

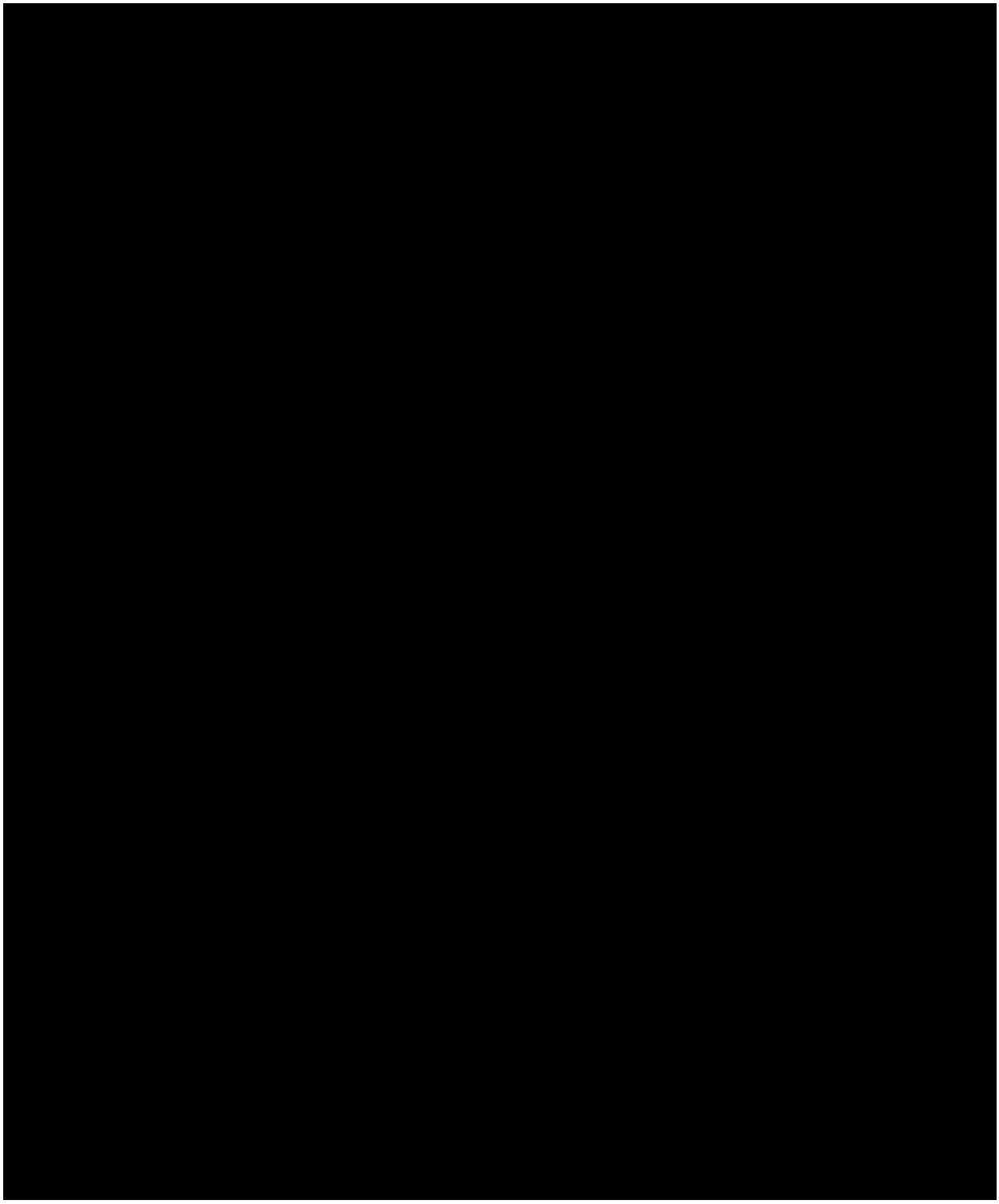

Figure 96: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-168 to 12-Bn-178.

Survey Area 11

Survey Area 11 was located in York Township in [redacted] Township 26 North, Range 8 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Earl Park Quadrangle (Figure 97 and Figure 98). The property was surveyed on October 3, 2015. The field, which had been planted with beans, had been harvested prior to survey, plowed, and planted with wheat. Ground surface visibility was approximately 70 percent with small amounts of harvested bean debris being the only visual obstacles. Approximately 105.09 acres were surveyed consisting of end moraines. The area contained Barce (BaB2 and BbA), Chalmers (Ch), Corwin (CsB2 and CsC2), Darroch (Dp), Drummer (Dx), Gilboa (GlA), Miami (MmC3), Montmorenci (MxB2), Odell (OlA), and Warners (Wb) soils. Eight sites were encountered during the survey (12-Bn-179 to 12-Bn-186). The sites ranged in size from prehistoric and historic isolated finds to a historic scatter of 2,751.86 square meters (0.68 acres).

[redacted]

The property owner, [redacted], visited Survey Area 11 and talked with the field crew. [redacted] informed the field crew that the parcel had been first cultivated in the late 1800s and was purchased by the [redacted] family in the 1970s. There was a stable previously located on the property, but had been bulldozed in the 1910s. [redacted] also informed the field crew that the Old Chicago Trail, a Native American trail, ran through the property. The Old Chicago Trail was the main Potawatomi trail through Benton and Warren counties and was marked as early as 1824 (Barce 1919:3). John Pugh, an early pioneer of Warren County, referred to the Potawatomi trail as the "Chicago Trail", due to the trail leading towards Lake Michigan (Barce 1919:10). The Old Chicago Trail was used by Native American and pioneers for fur trade (Barce 1919:3) and is shown on several maps to the west of Newton County and traveling through southern Benton County (Andreas 1968; Barce 1919:11; Geo. A. Ogle & Co 1909; Guernsey 1932; Taylor 2009:47)

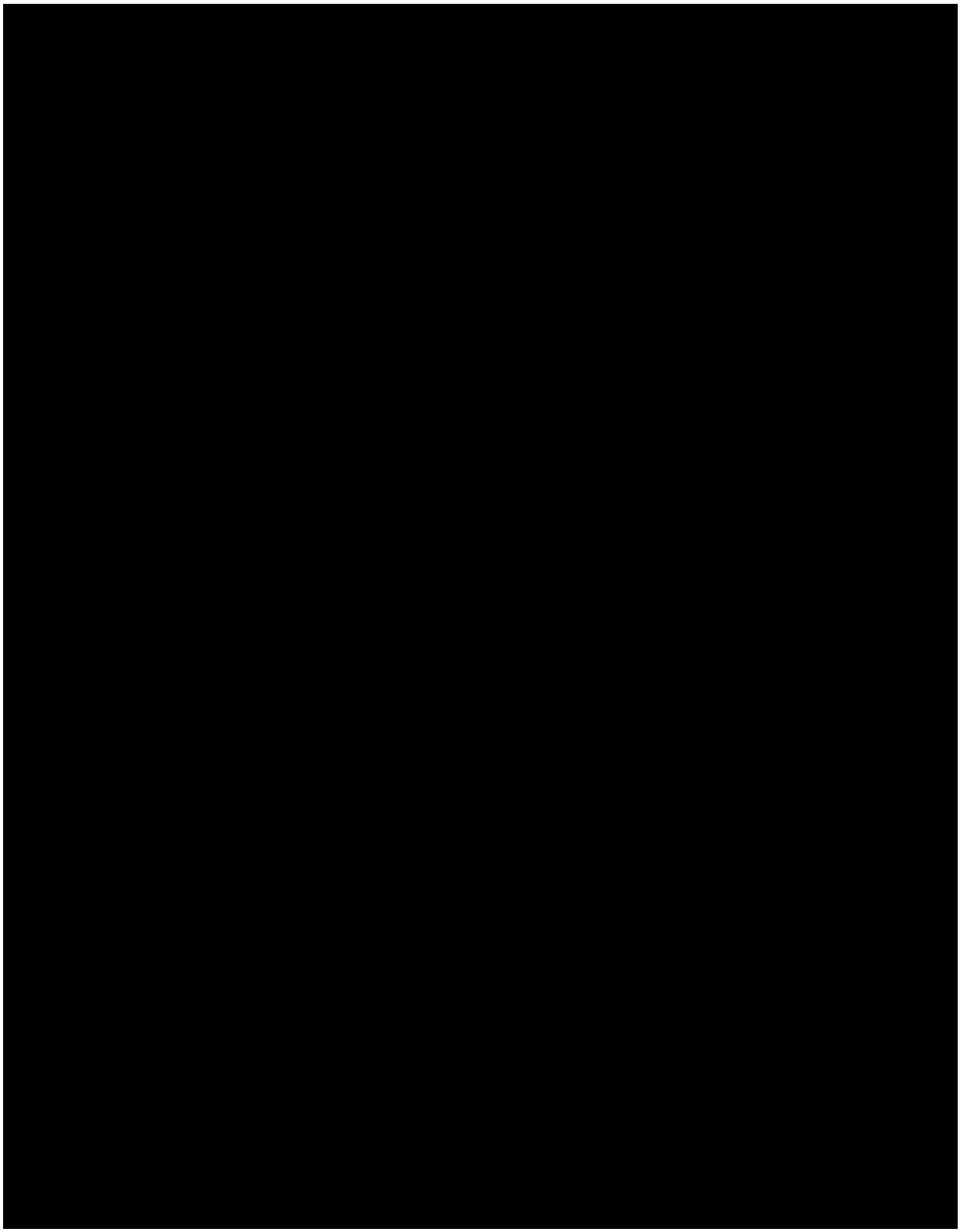

Figure 97: A portion of the map of York Township, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 11.

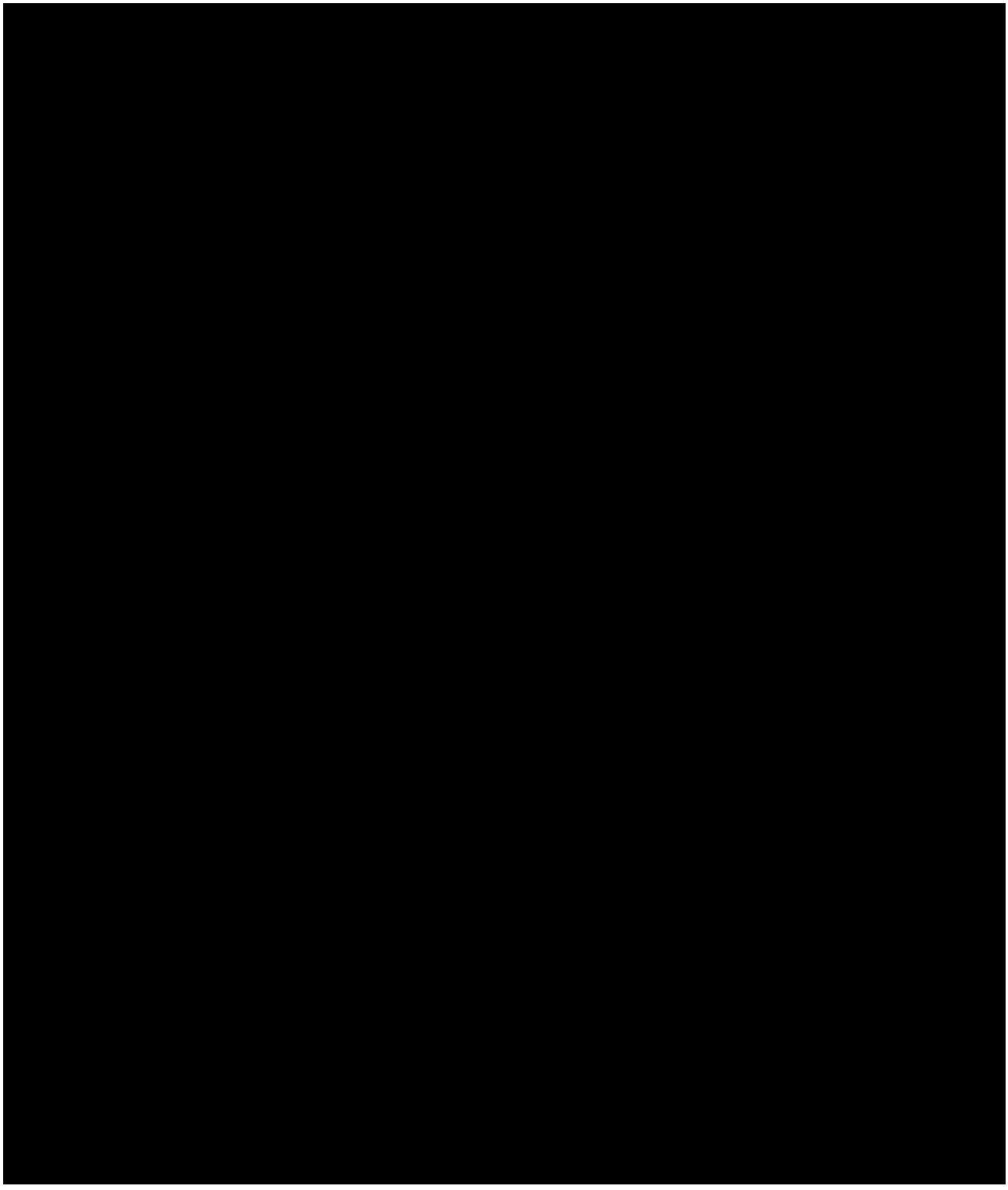

Figure 98: A portion of the USGS 7.5' Earl Park, Indiana Quadrangle showing the location of Survey Area 11.

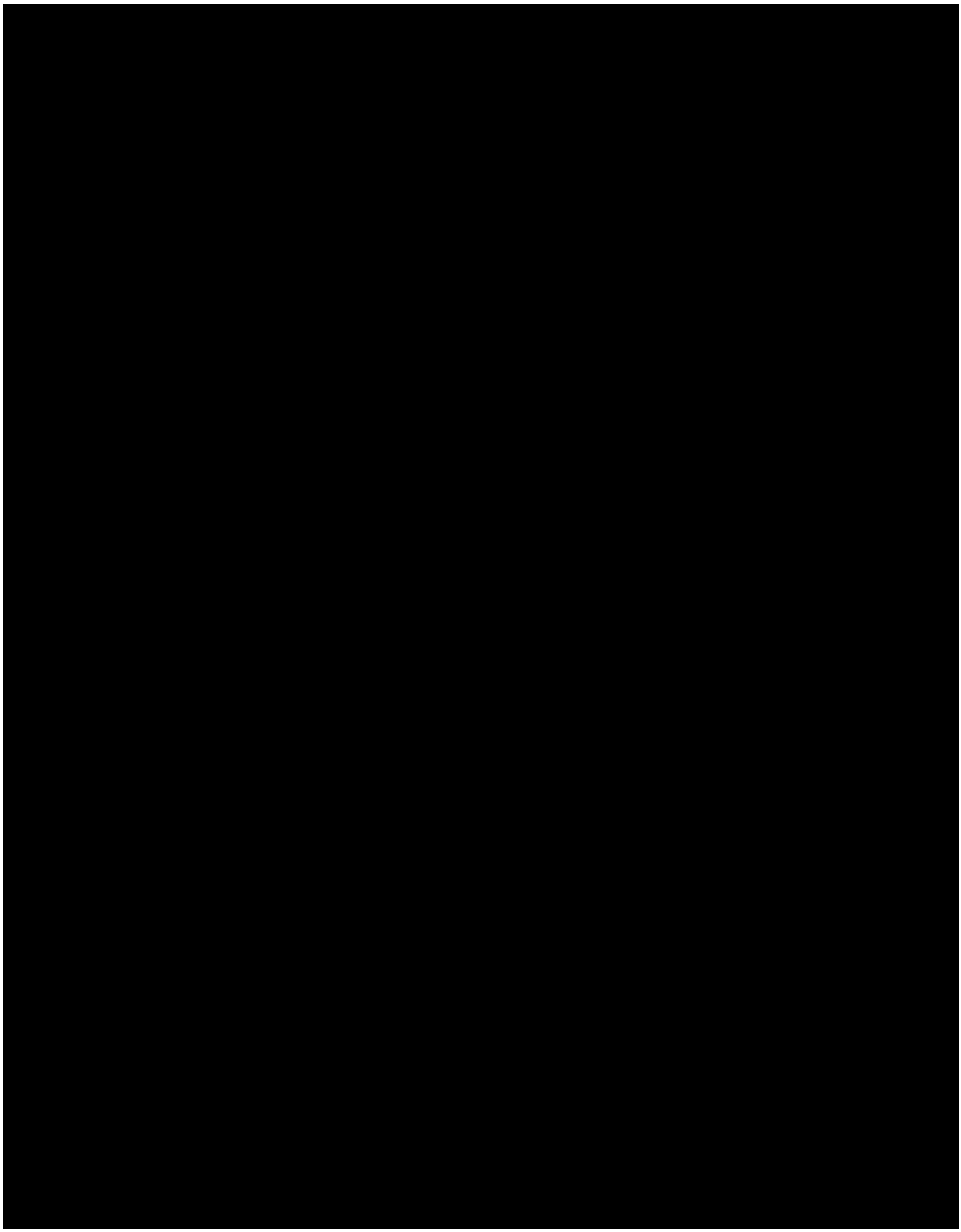

Figure 99: 2013 Aerial (Indiana Spatial Data Portal 2015) showing location of Survey Area 11 and [redacted] (Jackson 2013).

Figure 100: Photo taken standing near the center of Survey Area 11, facing southwest. [redacted] (photo taken by Christine Thompson, Ball State University).

Artifacts

A total of 48 artifacts were encountered in Survey Area 11. Table 26 provides a list of the artifacts recovered by category. Sample artifacts are shown in Figure 101 through Figure 105. Artifacts are listed by individual site in Volume 2, Appendix E.

One prehistoric artifact was recovered from site 12-Bn-179 (Figure 101). No diagnostic prehistoric artifacts were recovered from Survey Area 11.

Forty-seven historic artifacts were recovered from Survey Area 11 and of those, 41 are diagnostic (Table 27). Chronologically expressed these items include aqua glass recovered from site 12-Bn-183 which was manufactured between 1800 to the 1920s (Horn 2005:1). Plain whiteware recovered from sites 12-Bn-181and 12-Bn-183 was manufactured from 1820 to present (Stelle 2001: Chapter I). Stoneware with Albany glaze interior and a Bristol glaze exterior recovered from sites 12-Bn-181 and 12-Bn-183 was manufactured from 1830 to 1940 (Stelle 2001:Chapter I). Plain ironstone recovered from sites 12-Bn-180 and 12-Bn-184 was manufactured between 1842 to 1930 (Miller 2000; Stelle 2001:Chapter I). Green glass recovered from sites 12-Bn-180, 12-Bn-183, and 12-Bn-186 was manufactured between the

1860s to present (Horn 2005:1). Amber glass recovered from site 12-Bn-183 was manufactured between the 1860s to present (Horn 2005:1) Clear glass recovered from sites 12-Bn-180, 12-Bn-182, and 12-Bn-183 was manufactured between 1875 to present (IMACS 1992:473). Cobalt glass recovered from site 12-Bn-180 was manufactured between the 1890s to present (Horn 2005:1). Semi-Porcelain with hand painted floral pattern recovered from sites 12-Bn-180 and 12-Bn-186 was manufactured between 1890 to present (ODOT 1991:177). An iron and Semi-Porcelain spark plug recovered from site 12-Bn-183 was manufactured between 1926 and present (IMACS 1992). Stoneware with Albany glaze interior and exterior recovered from sites 12-Bn-180, 12-Bn-181, 12-Bn-183, and 12-Bn-184 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with a salt glaze interior and exterior recovered from site 12-Bn-180 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I). Stoneware with Albany glaze interior and salt glaze exterior recovered from site 12-Bn-183 was manufactured with a termination date of 1940 (Stelle 2001:Chapter I).

Table 26: Artifacts from Survey Area 11.

Prehistoric	No.	Historic	No.
Flake, Proximal	1	Ceramic, Semi-Porcelain	2
		Ceramic, Ironstone	2
		Ceramic, Whiteware	2
		Ceramic, Stoneware	23
		Glass, Amber	2
		Glass, Aqua	1
		Glass, Cobalt	1
		Glass, Clear	5
		Glass, Green	3
		Aluminum	1
		Iron, Hitch	1
		Iron, Hoe	2
		Iron, Horse Shoe	1
		Iron and Semi-Porcelain, Spark Plug	1
Total	**1**	**Total**	**47**

Table 27: Historic Diagnostics from Survey Area 11.

Artifact Type	Site	Date Range	Citation
Aqua glass	12-Bn-183	1800-1920s	Horn 2005:1
Plain whiteware	12-Bn-181, 12-Bn-183	1820 to present	Stelle 2001:Chapter I
Stoneware with Albany glaze interior and a Bristol glaze exterior	12-Bn-181, 12-Bn-183	1830-1940	Stelle 2001:Chapter I
Plain ironstone	12-Bn-180, 12-Bn-184	1842-1930	Miller 2000; Stelle 2001:Chapter I
Green glass	12-Bn-180, 12-Bn-183, and 12-Bn-186	1860s to present	Horn 2005:1
Amber glass	12-Bn-183	1860s to present	Horn 2005:1
Clear glass	12-Bn-180, 12-Bn-182, and 12-Bn-183	1875 to present	IMACS 1992:473
Cobalt glass	12-Bn-180	1890s to present	Horn 2005:1
Semi-Porcelain with hand painted floral patterns	12-Bn-180, 12-Bn-186	1890 to present	ODOT 1991:177
Iron and Semi-Porcelain spark plug	12-Bn-183	1926 and present	IMACS 1992
Stoneware with Albany glaze interior and exterior	12-Bn-180, 12-Bn-181, 12-Bn-183, and 12-Bn-184	Termination date of 1940	Stelle 2001:Chapter I
Stoneware with a salt glaze interior and exterior	12-Bn-180	Termination date of 1940	Stelle 2001:Chapter 1
Stoneware with Albany glaze interior and salt glaze exterior	12-Bn-183	Termination date of 1940	Stelle 2001:Chapter I

Figure 101: A proximal flake from site 12-Bn-179 (Photo by Kiya Mullins, Ball State University).

Figure 102: Representative historic ceramic artifacts from Survey Area 11 (Photo by Kiya Mullins, Ball State University).

Figure 103: Representative historic glass artifacts from Survey Area 11 (Photo by Kiya Mullins, Ball State University).

Figure 104: Iron and Semi-Porcelain spark plug recovered from site 12-Bn-183 (Photo by Kiya Mullins, Ball State University).

Figure 105: Representative historic iron artifacts from Survey Area 11 (Photo by Kiya Mullins, Ball State University).

Sites

Eight archaeological sites, 12-Bn-179 to 12-Bn-186, were recorded in Survey Area 11 (Figure 106 and Figure 107). Summaries for the individual sites are contained in Volume 2, Appendix F. Six sites had diagnostic artifacts (12-Bn-180 to 12-Bn-184 and 12-Bn-186). Two sites were historic isolated finds (12-Bn-182 and 12-Bn-185). One of the sites was a prehistoric isolated find (12-Bn-179). Five sites were historic scatters (12-Bn-180, 12-Bn-181, 12-Bn-183, 12-Bn-184, and 12-Bn-186).

All eight sites (12-Bn-179 to 12-Bn-186) were discovered on end moraines. Three sites (12-Bn-179, 12-Bn-183, and 12-Bn-184) was found on Corwin silt loam (CsC2) soil. One site (12-Bn-182) was found on Montmorenci silt loam (MxB2) soil. One site (12-Bn-185) was found on Chalmers silty clay loam (Ch) soil. One site (12-Bn-186) was found on Gilboa silt loam (GlA) soil. Two sites (12-Bn-180 and 12-Bn-181) were found on multiple soil types. One site (12-Bn-180) was found on Barce loam (BaB2), Corwin silt loam (CsC2), and Miami clay loam (MmC3) soils. One site (12-Bn-181) was found on Barce loam (BaB2) and Miami clay loam (MmC3) soils.

Site 12-Bn-183 was a historic scatter of 0.48 acres (1,942.49 square meters), containing 25 historic artifacts, located on the middle of the northern boundary of Survey Area 11. No sub-surface features or evidence of historic structures were encountered in 12-Bn-183 Three historic maps (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:37) were consulted to assess any potential historic influence. With no structural remnants or subsurface features encountered, it appears that 12-Bn-183 was a possible proximal historic dump site, rather than a primary deposit, due to its location on historic and modern day [redacted] The tight clustering of the artifacts suggests that topography played a part in the formation of the site, considering that the site is located on a slope. Artifacts could very possibly have been thrown from the road into the deposit area. The location of site 12-Bn-183 on a slope makes it unlikely that a structure would have been erected where the scatter was located. Based on the archaeological evidence and our historic research, it does not appear that 12-Bn-183 has the potential to yield additional information beyond the Phase I level.

12-Bn-183 and all other site types in Survey Area 11 are typically considered to not have the potential to yield additional information beyond the Phase I level and are therefore not considered eligible for the National Register of Historic Places.

Density

Survey Area 11 consisted of approximately 105.09 acres of end moraines. Within Survey Area 11, a density of one site per 13.13 acres occurred and sites covered 2.59 percent of the surface area.

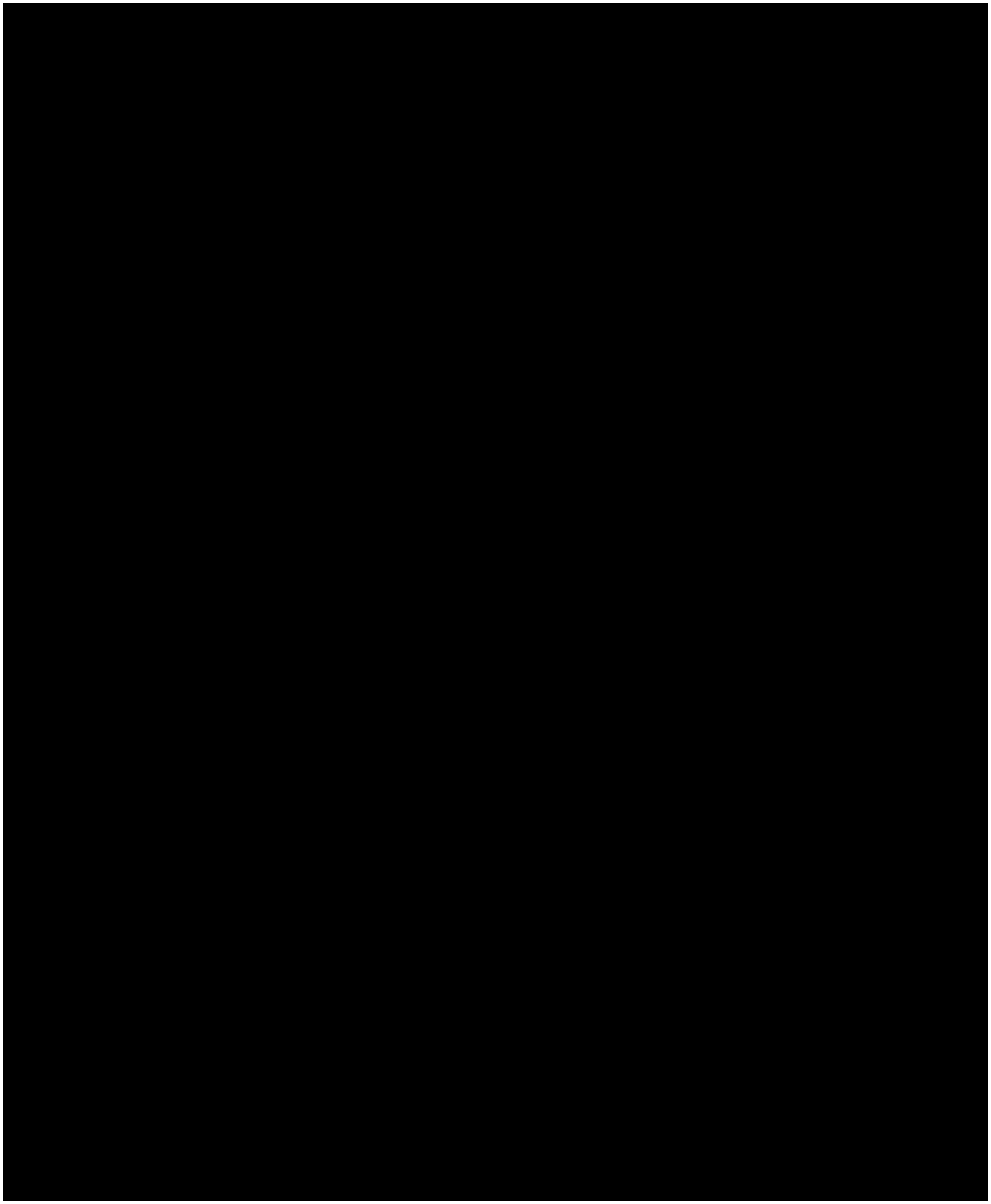

Figure 106: A portion of the USGS 7.5' Earl Park, Indiana Quadrangle showing the location of sites 12-Bn-179 to 12-Bn-186.

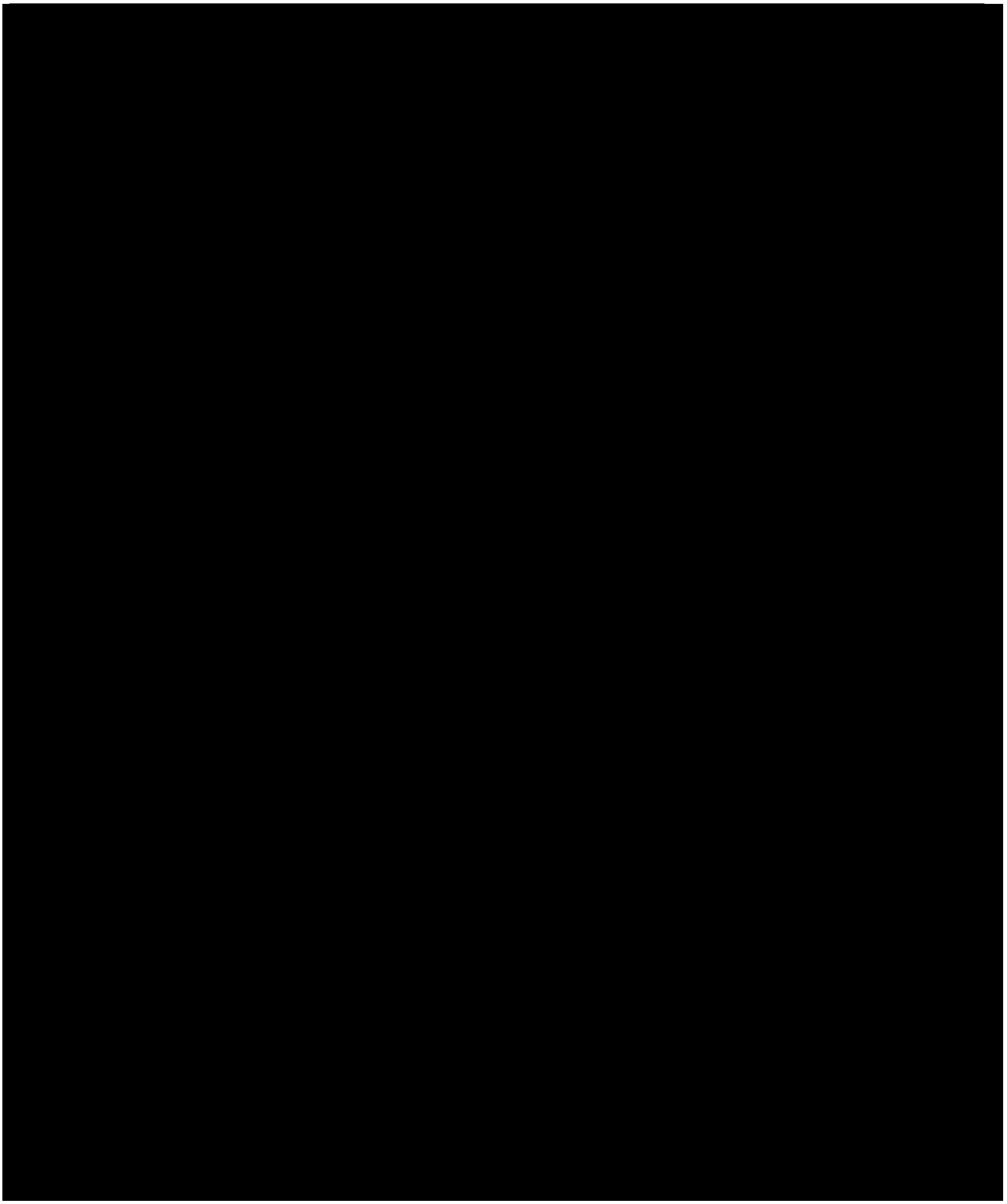

Figure 107: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the location of sites 12-Bn-179 to 12-Bn-186.

Survey Area 12

Survey Area 12 was located in Richland Township in [redacted] Township 26 North, Range 8 West as shown on the Benton County map in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) and the USGS 7.5' Wadena, Indiana Quadrangle (Figure 108 and Figure 109). The property was surveyed on October 3, 2015. The field had been harvested prior to survey with corn stalk remnants standing 6 to 12 inches tall. Ground surface visibility was approximately 30 to 50 percent with large amounts of corn debris left from harvesting being a visual obstacle. Approximately 20.39 acres were surveyed consisting of flood plains. The area contained Comfrey (Ck), Selma (Sk and Sh), Markham (MbB2), Montmorenci (MxB2), and Odell (OlB2) soils. No sites were encountered during the survey.

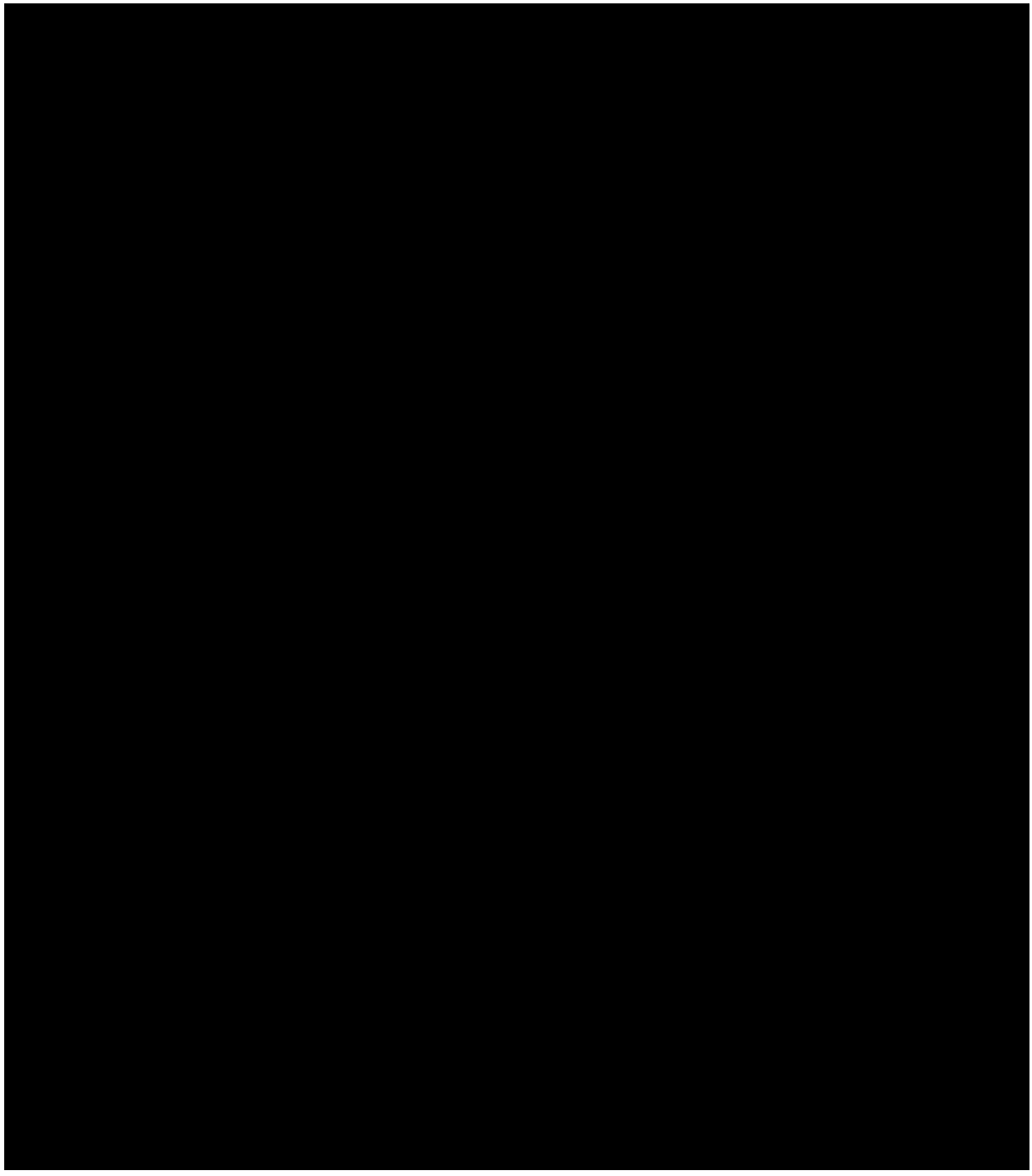

Figure 108: A portion of the map of Richland, Benton County in the "Illustrated Historical Atlas of the State of Indiana" (Andreas 1968) showing Survey Area 12.

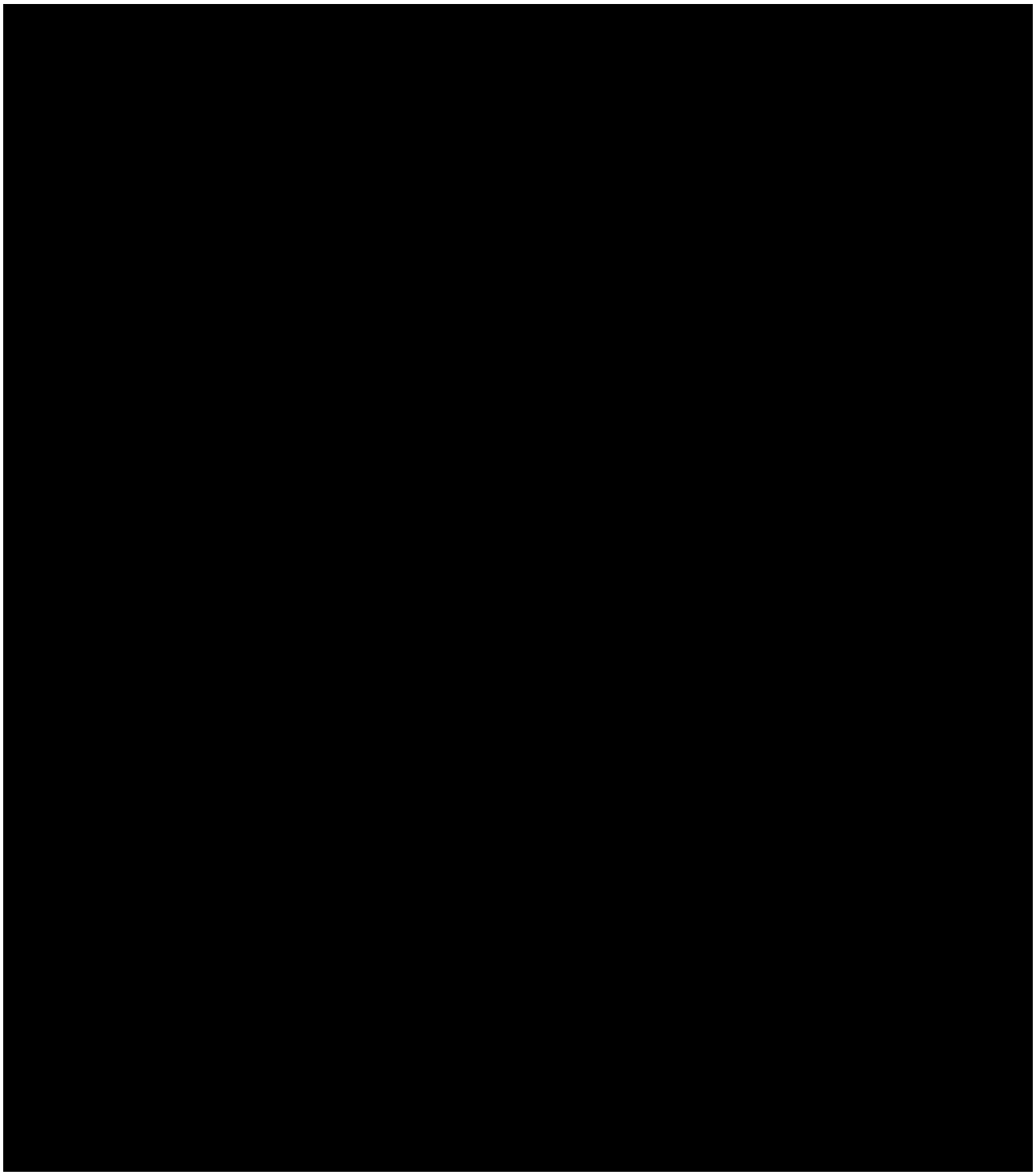

Figure 109: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the location of Survey Area 12.

Artifacts

No historic or prehistoric artifacts were recovered from Survey Area 12.

Sites

No archaeological sites were recorded in Survey Area 12 (Figure 110 and Figure 111).

Density

Survey Area 12 consisted of approximately 20.39 acres of flood plains. Within Survey Area 12, a density of zero site per 20.39 acres occurred and sites covered 0.00 percent of the surface area.

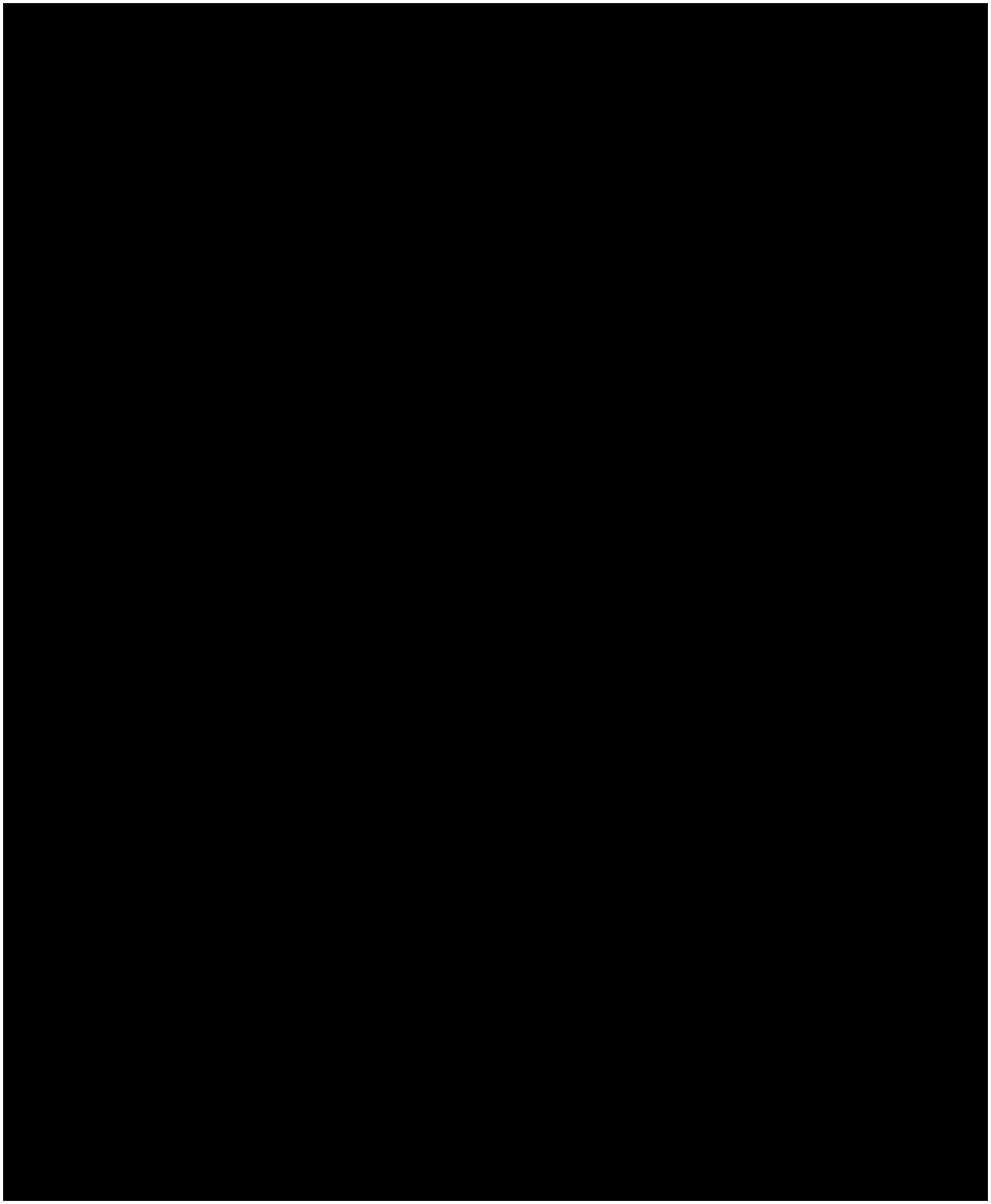

Figure 110: A portion of the USGS 7.5' Wadena, Indiana Quadrangle showing the lack of sites in Survey Area 12.

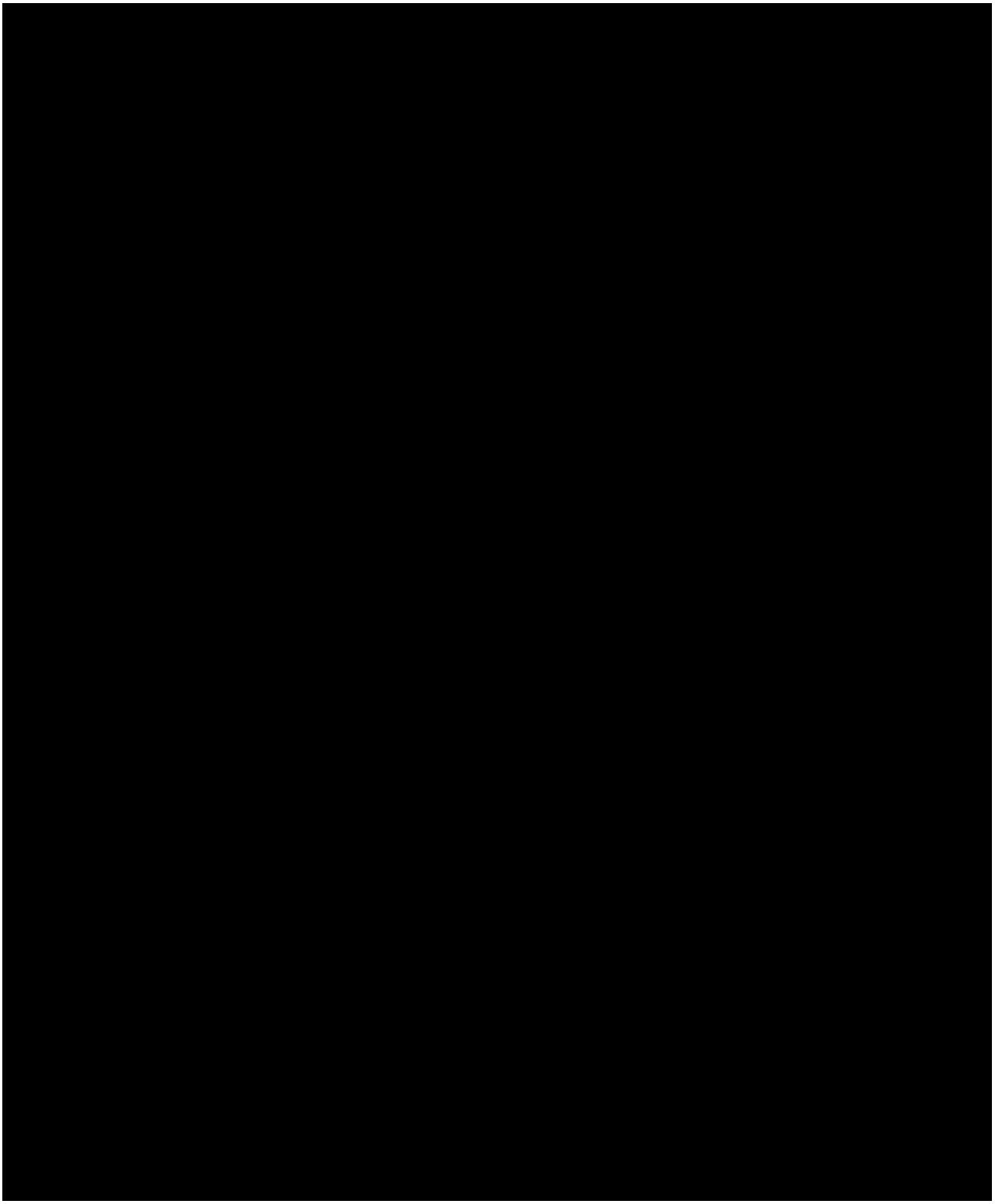

Figure 111: 2013 Aerial (Indiana Spatial Data Portal 2015) showing the lack of sites in Survey Area 12.

Summary/Discussion

A total of 841.29 acres were surveyed during this project and 85 new archaeological sites were recorded. No human remains were discovered as a result of this grant project. Twelve parcels in northern Benton County were surveyed. The survey documented the human occupation of Benton County with a presence during the Late Archaic and terminal Middle Woodland to early Late Woodland occupation, with other unidentifiable Prehistoric periods. Additionally, a possible Early Archaic notched scraper was recovered from an unidentified prehistoric site. The Historic period is the most strongly represented in the assemblages recovered during our survey (Table 28). Considering the limitations of Phase I surveys, it is presumptuous to assign functionality to sites identified during this survey. Site types were therefore not defined beyond isolates and scatters. However, it appears likely based upon the variation in artifact classes discovered on the sites that multiple sites types were represented.

Artifacts

The field survey recovered 81 prehistoric artifacts (1 per 10.39 acres) and 442 historic artifacts (1 per 1.90 acres) (Table 28). The majority of prehistoric artifacts consist of lithic debitage. The edge modification of approximately seven flakes indicates the debitage could have functioned as expedient tools. Two of the formal lithic tools (Table 28) were projectile points, with one dating to the Late Archaic period and the other to the Middle Woodland/Late Woodland period (Justice 2006:115-116, 119-121). Other stone tools consisted of scrapers and flake tools, including one possible Thebes point retouched into a hafted scraper. Historic artifacts included various types of ceramics, various colors and types of glass, metal objects, and brick fragments.

Chert

Lithic artifact chert types are shown in Table 29. The chert identification is listed by geologic time period as this is the most accurate and consistent means of identification. Chert was then listed by which type it is most consistent with as described in Cantin (2008) and in comparison with specimens in the AAL comparative collections and several print resources (Cantin 2008; Deregnaucourt and Geogiady 1998; Stelle and Duggan 2003). If the artifact material displayed characteristics that were consistent with multiple chert types, all applicable types were listed in the identification. The locations of chert outcrops in Indiana are shown in Figure 4, and outcrop vicinities in Illinois are shown in Figure 8.

The lithic artifacts for this survey were dominated by Silurian cherts (44%). Of the Silurian assemblage a majority was consistent with Laurel chert (22%). No natural chert

outcrops exist within Benton County. However, outcrops of Laurel chert exist in Decatur, Fayette, Franklin, Jefferson, Jennings, Ripley, and Wayne counties, the closest of which is found in Wayne County and approximately 183 km to the southeast of Benton County (Cantin 2008. Specimens consistent with Liston Creek chert appear in fourteen percent of the assemblage recovered from the survey areas. The closest outcrop of this chert exists in Miami County, which is approximately 85 km to the east of Benton. None of the projectile points recovered were made from Silurian chert. This may indicate that Silurian age chert, particularly that consistent with Laurel, was used primarily for non-point tool manufacture, or even expedient tool manufacture.

Table 28: Recovered artifacts from Benton County.

Prehistoric	No.	Historic	No.
Biface, Hafted	2	Ceramic, Porcelain	1
Biface, Unhafted	5	Ceramic, Semi-Porcelain	2
Biface, Scraper	2	Ceramic, Ironstone	23
Core	8	Ceramic, Whiteware	52
Core, Fragment	1	Ceramic, Yelloware	2
Flake, Proximal	16	Ceramic, Stoneware	127
Flake, Distal	7	Glass, Amber	15
Flake, Medial	14	Glass, Amethyst	18
Flake, Edge Modified	6	Glass, Turquoise	1
Flake, Utilized	14	Glass, Green	9
Flake, Shatter	6	Glass, Green/Turquoise	8
		Glass, Aqua	54
		Glass, Cobalt	4
		Glass, Clear	85
		Glass, Milk	11
		Aluminum	1
		Iron	14
		Iron, Shotshell	1
		Iron, Handle	1
		Iron, Screw and Washer	1
		Iron, Hitch	1
		Iron, Hoe	2
		Iron, Horse Shoe	1
		Iron and Semi-Porcelain, Spark Plug	1
		Brass Button	1
		Bone	3
		Brick (not collected)	154+
		Charcoal	3
Total	81	**Total Collected**	442

Mississippian chert had the second greatest representation in this survey (36%). Of the Mississippian material recovered, those consistent with Attica comprised the majority of the collection (39%). Outcrops of Attica exist in Boone, Fountain and Warren counties, all of which are located approximately 15 km south of Benton County. Both of the hafted projectile points recovered were made from Mississippian chert, which were consistent with Attica, Muldraugh, and Wyandotte chert (from sites 12-Bn-152, 12-Bn-164, and 12-Bn-165). One of the identifiable points dated to the Late Archaic period (from site 12-Bn-152) was made of chert consistent with Attica and Muldraugh. Burlington chert (8%), which comes from central and western Illinois, and Wyandotte (3%) which comes from southern Indiana, are typically higher quality material than what is found in northwest Indiana. Both Wyandotte and Burlington would have been highly prized in prehistoric times, and in fact were widely traded at various periods in prehistory (see Greber et al. 1981; Nolan et al. 2007; Pacheco 1997; Ruby 1997; Seeman 1975). The distance to these materials indicates that trade would likely have been active at least at some point between the areas that are now northwest Indiana and central/southwest Illinois.

Pennsylvanian chert is the third greatest in abundance (10%) with specimens most consistent with Holland chert forming the entire Pennsylvanian assemblage. The low amount of Pennsylvanian chert is to be expected as the sources of these cherts in Indiana are located exclusively in the southern half of the state. Holland in particular outcrops about 300km to the south in Dubois County. None of the points recovered during field survey were made of Holland chert.

Devonian chert also has the third greatest representation in this survey (10%). All of the Devonian chert recovered comprised of chert consistent with Jeffersonville (10%). As mentioned in the introduction, there are no natural chert outcrops in Benton County. However, outcrops of Jeffersonville exist in Bartholomew, Decatur, Jefferson, Jennings, and Scott counties, all of which are located approximately 185 km to the southeast of Benton County. None of the points recovered during field survey were made of Jeffersonville chert.

The breakdown of the chert tells us that prehistoric people living in Benton County were likely relying primarily on exotic lithic materials from further south and southeast such as Holland, Laurel, and Wyandotte, as well as from central and southwest Illinois in the form of Burlington for their chert materials (material consistent with Laurel comprises 22 percent of lithic material) (Table 29). It also indicates that this reliance on the distant chert resources was supplemented with closer chert sources (Attica to the south and southeast of Benton County). The breakdown of the lithic assemblage could indicate that the peoples that inhabited Benton County during prehistoric times migrated from south and southwest of the county, bringing chert materials with them or could have had extensive trade routes across the state. Benton County may not have been an area of primary habitation due to the open prairies that provided little cover but the locations of the projectile points south of Pine Creek on small rises of forest

soils (alfisols; Figure 88), could show areas of hunting used during the Late Archaic and Late Woodland periods.

Table 29: Chert Raw Materials.

Chert	No.	Percent of the Whole Assemblage
Silurian Chert	**34**	**44**
Consistent with Laurel	17	22
Consistent with Liston Creek	11	14
Consistent with Kenneth	6	8
Devonian Chert	**8**	**10**
Consistent with Jeffersonville	8	10
Mississippian Chert	**28**	**36**
Consistent with Attica	11	14
Consistent with Blanding	2	3
Possible Blanding heat treated	1	1
Consistent with Burlington	6	8
Consistent with Derby	2	3
Consistent with Flint Ridge	1	1
Consistent with Lost River	1	1
Consistent with Muldraugh	1	1
Consistent with Upper st. Louis	1	1
Consistent with Wyandotte	2	3
Pennsylvanian Chert	**8**	**10**
Consistent with Holland	8	10
Total	**78**	**100**

Sites

Of the 85 archaeological sites, 40 had unidentified Prehistoric components (Table 30). The identified precontact components consisted of one possible Early Archaic site, one Late Archaic site, and one Middle Woodland site. Fifty-four sites had Historic components, dating from the early 18th century to present. Previously recorded sites for the till plain of central Indiana support the trend of encountering low frequencies of Paleoindian, Early Woodland and Middle Woodland component sites.

Table 30: Site Components Recorded as a Result of Survey.

Component	No.	Comment
Unidentified Prehistoric	40	11 Multicomponent (8 Historic)
(Early Archaic)	(1)	1 Multicomponent
Late Archaic	1	1 Multicomponent
Middle Woodland	1	1 Multicomponent
Historic	54	8 Multicomponent (8 Unidentified Prehistoric)
Total	**96**	

Historic Settlement

Fifty-four sites with Historic components were discovered. These sites ranged from small to extensive historic scatters and were occasionally multicomponent with Unidentified Prehistoric isolates or scatters, while Site 12-Bn-152 contained a diagnostic Prehistoric component. The historic component sites yielded the vast majority of artifacts recovered during the project.

Survey Areas 1, 4, 5, 7, 9, and 10 contained sites with relatively substantial historic assemblages that had early historic dates between the mid-1700s and 1850, but also artifacts dating into the mid to late nineteenth century and early twentieth century (12-Bn-107, 12-Bn-123, 12-Bn-125, 12-Bn-133, 12-Bn-152, and 12-Bn-178). Based on historic research and the lack of subsurface features, four of these sites (12-Bn-107, 12-Bn-125, 12-Bn-133, and 12-Bn-178) appear to be historic dump sites, or secondary deposits from relatively recent to modern activity, rather than primary deposits and locations of structures or activity areas possibly associate with early occupation of the county. This could indicate social attitudes in the area towards refuse dumps and the inclination of the people to dump their items elsewhere rather than on house lots. Sites 12-Bn-107, 12-Bn-123, 12-Bn-125, and 12-Bn-152 were recommended for further study; however, sites 12-Bn-133 and 12-Bn-178 were not recommended potentially eligible because there was no indication that they have the potential to yield additional significant information beyond the Phase I level. Prior to this survey, there were six historic scatters reported for Benton County; this project has greatly supplemented the available data on historic land use and refuse disposal patterns in the county. Further research and analysis of our data could greatly increase our understanding of early historic occupation in Benton County.

Density

The project documented an average of one site per 9.9 acres and an average artifact density of one artifact per 1.61 acres surveyed. The project documented an average artifact density of one historic artifact per 1.9 acres surveyed and an average artifact density of one

prehistoric artifact per 10.39 acres surveyed. Artifact densities by survey area are presented in Table 31.

Table 31: Artifact Densities

Survey Area	No. Acres	No. Sites	Sites per Acre	No. Artifacts	Artifacts per Acre
SA 1 (Ground moraines and end moraines)	92.34	10	7.95	81	1.14
SA 2 (Ground moraines, end moraines, flood plains, and outwash terraces/plains)	30.16	7	4.31	8	0.27
SA 3 (End moraines)	107.01	4	26.75	5	0.05
SA 4 (Outwash terraces/plains)	16.79	2	16.79	10	1.68
SA 5 (Ground moraines and end moraines)	67.05	6	11.18	175	1.38
SA 6 (Flood plains)	27	2	13.5	4	0.15
SA 7 (Ground moraines and end moraines)	36.58	4	9.15	27	0.74
SA 8 (Ground moraines and end moraines)	195.97	3	65.32	4	0.02
SA 9 (Ground moraines and end moraines)	105.85	28	3.78	90	1.18
SA 10 (End Moraines)	37.06	11	3.37	71	0.52
SA 11 (End Moraines)	105.09	8	13.3	48	0.46
SA 12 (Flood plains and outwash terraces/plains)	20.39	0	0	0	0.00
Total	**841.29**	**85**	**9.90**	**523**	**1.61**

Recommendations

Of the 85 archaeological sites discovered by this project, 79 are not considered eligible for listing on the Indiana Register of Historic Sites and Structures or the National Register of Historic Places (Table 32). Most of these ineligible sites were prehistoric isolated finds, historic isolate finds, small scatters of historic artifacts, or small scatters of lithic artifacts. Sites 12-Bn-107 and 12-Bn-125 were medium sized historic scatters, comparatively larger than the other sites in Survey Area 1 and Survey Area 5, respectively. While historic maps failed to reveal any structures within or near the scatter, historic maps do show the relative proximity to Denton's or Walnut Grove (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009:37). With no structural remnants or subsurface features encountered, it is possible that 12-Bn-107 and 12-Bn-125 were historic dump sites, rather than primary deposits, for Denton's Grove. The tight clustering of the artifacts suggests that topography played a part in the formation of the sites, considering that the sites are located on a slope. Both sites are situated in similar topographic and ecological settings at the intersection of forest and prairie soils at approximately the same elevation on a slope. While 12-Bn-107 and 12-Bn-125 do not appear to have been settlement or structure locations, substantial information about the lives of the Denton family or other early settlers could be contained in this slope midden. Based on the archaeological evidence and our historic research, 12-Bn-107 and 12-Bn-125 are potentially eligible under Criteria D.

Site 12-Bn-123 is a dense historic scatter with nine historic artifacts and over 150+ bricks. While the three historic maps consulted (Andreas 1968; Geo. A. Ogle & Co 1909; Taylor 2009) do not show a historic structure located in Survey Area 4, the USGS 7.5' Earl Park, Indiana Quadrangle shows an outline of a structure at the location of Site 12-Bn-123. Site 12-Bn-123 is located on a small flat rise that overlooks [redacted] and is an ideal location for a structure. The Indiana Historical Aerial Photo Index (IHAPI) shows that a structure was positioned on the location of 12-Bn-123 as early as 1951 and disappearing between 1963 and 1971 (Indiana Geological Survey 2015). The variety of domestic artifacts and the historic structure indicate a potential to learn more about domestic mid-century farmhouse lifestyle, filling a gap in Benton Counties history. Based on the archaeological evidence and our historic research, it appears that 12-Bn-123 has the potential to yield additional information beyond the Phase I level and should be considered potentially eligible under Criteria D for the National Register of Historic Places and recommended for additional research.

Sites 12-Bn-152, 12-Bn-162, and 12-Bn-165 were also determined to be potentially eligible for listing on the Indiana Register of Historic Sites and Structure or the National Register of Historic Places. Sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 have the potential to yield additional information beyond the Phase I level based on the artifact assemblages, the soil context, and the possible unique micro-ecology. Viewed together, these sites exhibit a pattern of wetlands landscape usage based on the location of these sites on small areas of well drained soils within a larger poorly drained area characterized by wet prairie environments or ponds (see Surface-Evans 2015; Surface-Evans et al. 2005). Individually sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 do not seem to be eligible under Criteria D; however, as a group they illustrate a pattern of behavior (a type of environmental exploitation strategy) that represents an important trend in prehistoric interaction with and exploitation of the wetlands of northwest Indiana. The variety of chert and diagnostic points found in Survey Area 9 suggest trade and lithic production persisting for millennia. For these reasons sites 12-Bn-152, 12-Bn-164, and 12-Bn-165 may be eligible for listing on the Indiana Register of Historic sites under Criteria C (i.e., the site (s) represent a significant and distinguishable entity whose components may lack individual distinction [National Park Service 2014]). Sites and adjacent contextual areas should be an item of further investigation.

Table 32: Site Recommendations.

Recommendation	Site No.
No further archaeological investigations recommended; n=79	12-Bn-102 to 12-Bn-106, 12-Bn-108 to 12-Bn-122, 12-Bn-124, 12-Bn-126 to 12-Bn-151, 12-Bn-153 to 12-Bn-163, 12-Bn-166 to 12-Bn-186
Further archaeological investigations recommended (high density, lithic isolates, lithic scatters, and historic scatters); n= 6	12-Bn-107, 12-Bn-123, 12-Bn-125, 12-Bn-152, 12-Bn-164, and 12-Bn-165

Though there were a limited number of recommended sites in this survey, three of the sites that we recommend (12-Bn-107, 12-Bn-123, and 12-Bn-125) could be significant in their contribution to the understanding of Benton County historic settlement. The remaining recommended sites/components (12-Bn-152, 12-Bn-164, and 12-Bn-165) could yield significant information (as a group) about a type of environmental exploitation pattern found in wetland environments.

Public Outreach and Student Involvement

On September 26, 2015, Ball State University's Applied Anthropology Laboratories took part in Mound State Park's annual Indiana Archaeology Month activities. There were numerous hands-on demonstrations and participant activities for visitors. A poster depicting the methodology and goals of the FY2015 Grant surveys in Newton and Benton counties was presented. Ball State archaeologists and students used this public event to speak with numerous local individuals fostering public interest and awareness in this HPF Grant survey. Approximately 150 members of the public attended this event at Mounds State Park, Anderson, Indiana.

In November 16, 2015 an Open House was held in the Applied Anthropology Laboratories. The goals of the open house were to showcase current projects that included student involvement, encourage additional student involvement, and to invite possible community and professional collaborators to view our work and in-process projects. The focus of the Benton County FY2015 Grant exhibit was twofold. Historic and prehistoric artifacts were displayed and explained to the public in order to demonstrate the diversity of knowledge necessary for archaeological investigations such as this. In addition, chert and lithic identification with hands-on demonstrations of the identification and cataloging processes were given to Open House attendees.

On April 25, 2016, a public presentation was given at the Newton County Government Center in Morocco, Indiana, by AAL archaeologist Christine Thompson and Department of Anthropology graduate student Jamie Leeuwrik (Figure 112 and Figure 113). The presentation was sponsored by the Newton County Historical Society and was a joint presentation for the two FY2015 HPF grants in Benton and Newton Counties. The hour long presentation reviewed all aspects of the grants including background, methodology, and results. Both historic and prehistoric artifacts representative of newly discovered sites were available for the attendees to view. A student-created video was also shown that described and illustrated our methodology, field techniques, artifact processing, and identification. Over 60 people attended the presentation which included a question and answer session, and a short discussion of Indiana archaeology laws. Coverage of this presentation and project proceedings in general were also posted to the AAL's Facebook page and various other social media sites. [redacted], a local collector and landowner of a surveyed parcel in Newton County, brought artifacts found in Newton County to be used as part of the presentation. The crowd was enthusiastic and very interested in the research results. An attendee emailed after the presentation: "I think projects like this illustrate the need for archaeology and the public to become a lot more familiar with one another. Amateur collectors, for instance, are already aware of things in most settings that the 'science' of archaeology may take years to discover and document, or miss entirely. Archaeologists know about the relative significance of those things

discovered—things that amateur collectors and the public would like to know. Your presentations go a long way toward promoting that interplay."

Throughout this project there was broad support for the pedestrian surveys from the residents of Benton County. Thirteen landowners gave permission to survey their properties totaling 1,707.24 acres of agricultural land available for survey. Landowners who granted permission to survey their property were very enthusiastic and eager to have their fields surveyed. Landowners were deeply interested in the types of artifacts that were found and how their property was used in prehistory and during Euro-American contact. Numerous personal phone calls were made with various landowners who expressed great interest in participating in the survey and shared with the author the types of artifacts that had been surface collected on their property in the past. It became apparent that Benton County has an active and involved public that displays a great interest in their county's history, both historic and prehistoric.

In addition to public presentations and demonstrations, the results of the Benton County HPF grant are being published in various ways. An article on the overall results of this FY2015 Grant will be published in the Indiana Archaeology journal, compiled and distributed by DHPA.

Throughout this project, there has been a very large amount of Ball State University Department of Anthropology student involvement and participation. All students were supervised and mentored by Co-PIs Thompson and Nolan. Fourteen students were involved with the fieldwork and participated in field surveys. Two students were involved in washing and cataloging of artifacts. One student was responsible for artifact photography. Two students assisted with compiling and entering all of the data into the SHAARD database. One student assisted with the presentation at the Newton County Government Center on April 25, 2015. One student from the 2012 Blackford County HPF project created the methodology video that was shown during that this year's HPF Grant presentation.

Figure 112: Crowd gathering for the FY2015 HPF grant presentation for Newton and Benton Counties held at the Newton County Government Center (photo by Christine Thompson, Ball State University).

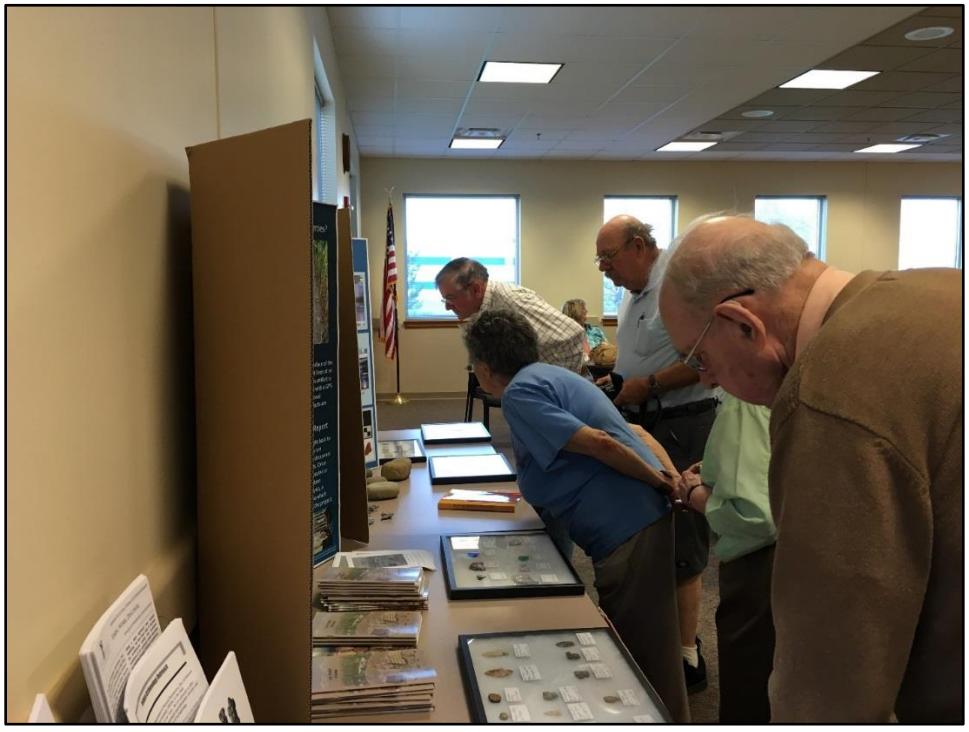

Figure 113: Attendees viewing the posters and exhibits at the FY2015 HPF grant presentation for Newton and Benton Counties held at the Newton County Government Center (photo by Christine Thompson, Ball State University).

Alignment with Cultural Resources Management Plan for Indiana

This FY2015 HPF Grant addressed various goals and objectives in Indiana's Cultural Resource Management Plan for 2013-2019 (Division of Historic Preservation and Archaeology 2012) by increasing and fostering public awareness and interest in the archaeological resources of Benton County. This grant project enhanced understanding and relationships in Benton County from curious citizens, to landowners, to collectors.

The first goal of Indiana's Cultural Resource Management Plan 2013-2019 (Division of Historic Preservation and Archaeology 2012:33) is to increase public awareness, public understanding, and public support for preservation archaeology. Through numerous waves of letters mailed to sixteen landowners in Benton County, through public events such as the annual Archaeology Month Activities at Mound State Park, and with the public presentation held in Newton County in April 2016, AAL has been able to make the public aware of both our HPF grant surveys and the importance of archaeology. The AAL has received broad support, interest, and enthusiasm from the people of Benton County. They have shown a great interest in the history and prehistory of their county, and are excited to be a part of the surveys to learn more about their own property. They also realize the importance of protecting these archaeological resources as evidenced by the attendance and interest at the presentation at the Newton County Historical Society in Newton County. These activities have helped meet Indiana's objectives of increasing public awareness through varied efforts, media, and programs aimed at all Hoosiers; increasing public understanding of Indiana's cultural resources and our statewide heritage; and increasing the public support for heritage preservation by marketing its benefits.

The second goal of Indiana's Cultural Resource Management Plan 2013-2019 (Division of Historic Preservation and Archaeology 2012:34) is to broaden the preservation and archaeology communities and promote archaeology preservation communities. As stated in the first goal, numerous public events and presentations have taken place as part of the FY2015 Benton County HPF Grant. In addition, several articles have been or are being submitted to the Indiana Archaeology journal and may be submitted to other publications or presented at conferences. Redacted versions of both grant reports will be available for public review on AAL's web site. The activities listed in Goal 1 and the publications listed here have helped and will help meet Indiana's objectives of building relationships among people and groups with similar or complementary purposes and to identify new partners and develop opportunities for collaboration.

The third goal of Indiana's Cultural Resource Management Plan 2013-2019 (Division of Historic Preservation and Archaeology 2012:35) is to advocate for preservation opportunities and options for all community, cultural, and heritage resources. Although AAL's FY2015 HPF Grant did not have a direct impact on this goal, it is hoped that our grant projects could be the foundation for future preservation opportunities and options for Benton County.

The final goal of Indiana's Cultural Resource Management Plan 2013-2019 (Division of Historic Preservation and Archaeology 2012:37) is to advance preservation as economic development. Again, AAL's FY2015 HPF Grant did not have a direct impact on this goal. However, it is hoped that through the presentations, online journal articles, and the online redacted versions of the two grant reports the public may start to think of ways to protect, promote, and capitalize on their cultural and archaeological resources.

Research Questions

The following research questions, while not exhaustive, guided this project.

1. What is the cultural chronology for Benton County?
2. What are the densities and distributions of archaeological sites in northern Benton County?
3. What is the settlement pattern for Euro-American people in northern Benton County?
4. What is the average site density within the county?
5. Is prehistoric occupation more extensive and/or more intensive at the ecotones between the environmental zones?

We will address our findings of each of these questions, in order, below.

1. What is the cultural chronology for Benton County?

Prior to this year's survey, Benton County had 44 Unidentified Prehistoric sites, six Paleoindian sites, 25 Archaic sites (seven Early Archaic, four Middle Archaic, eleven Late Archaic, and three unidentified Archaic), five Woodland sites (one Early Woodland, one Middle Woodland, and three Late Woodland), no Late Prehistoric sites, 12 Historic sites, and six sites with unknown time periods.

This project has added to the cultural chronology of the county with 85 sites including 40 Unidentified Prehistoric site components, one possible Early Archaic site component, one Late Archaic site component, one Middle Woodland site component, and fifty-four historic site components (Table 22).

In addition, one previously undocumented projectile point type was added to the knowledge of Benton County's prehistory (Table 34). The three formal lithic tools were projectile points, with one possibly dating to the Early Archaic period and another to the Late Archaic period (Justice 1987:115-116, 119-121). The third projectile point dates to the Middle Woodland time period (Justice 1987:208).

Table 33: Number of Site Components Added.

Cultural Period	Added	Previous	Total
Unidentified Prehistoric	**40**	**44**	**84**
Paleoindian (ca. 10,000 – 7500 B.C.)	**0**	**6**	**6**
Archaic	**1**	**25**	**26**
Early Archaic (ca. 8000 – 6000 B.C.)	0*	7	7
Middle Archaic (ca. 6000 – 3500 B.C.)	0	4	4
Late Archaic (ca. 4000 – 700 B.C.)	1	11	12
Unidentified Archaic	0	3	3
Woodland	**1**	**5**	**6**
Early Woodland (ca. 1000 – 200 B.C.)	0	1	1
Middle Woodland (ca. 200 B.C. – A.D. 600)	1	1	2
Late Woodland/Late Prehistoric (ca. A.D. 500 – 1650)	0	3	3
Unidentified Woodland	0	0	0
Mississippian	**0**	**2**	**2**
Protohistoric/Contact	**0**	**0**	**0**
Historic (post A.D. 1650)	**54**	**12**	**66**
Unknown	**0**	**6**	**5**
Total	**96**	**100**	**196**

Table 34: Documented Points within Benton County (* indicates point added from this survey).

Cultural Period	Projectile Point Types
Paleoindian	Clovis, Dalton
Early Archaic	Barbee Corner Notched, Dovetail, Hardin Barbed, Kirk Corner Notched, Palmer, St. Charles, Thebes*
Early-Middle Archaic	Raddatz Side Notched
Middle- Late Archaic	Unidentified Concave Base, Unidentified Side Notched
Late Archaic	Brewerton*, Durst, Lamoka, Matanza, Riverton, Vosberg Corner Notched, Unidentified Side Notched, Unidentified Expanding Stem
Terminal Late Archaic	N/A
Early Woodland	Perkiomen Broad, Susquehanna Broad
Middle Woodland	Snyder
Late Woodland/ Late Prehistoric	Jack's Reef, Stueben Corner Notched *, Unidentified Side Notched

* Possible Thebes Notched scraper not assigned an official age.

Precontact settlement within Benton County is dominated by Archaic cultural periods, especially by Late Archaic, followed by Late Woodland cultural periods. Very little information has been recovered for the Early and Middle Archaic, Early and Middle Woodland, and Paleoindian cultural phases. These results are likely skewed for several reasons. Benton County has no major river and the county is drained by five main streams: Big Pine Creek, Mud Pine Creek, Sugar and Mud Creek, and Carpenter Creek. The water supply for Benton County is primarily ground water from deposited glacial till (Barnes 1989:2). A lack of accessible surface water and the predominance of poorly drained prairie soils is not conducive for settlement and

Benton County is comprised primarily of Argiudoll and Endoaquoll soils, which are somewhat poor and poorly drained soils, with rises of Hapludalf soils, which are well and moderately well drained soils. The micro-ecologies created by this combination of well and moderately well drained soils are generally small and present a unique diversity of resources (Barnes 1989: 1). Survey Area 9 represents a potential settlement pattern favoring this micro-ecology. This mirrors the pattern of environmental exploitation of wetlands found by Surface-Evans (2015) in the Kankakee Marsh Region.

Identifying more of these areas in the future will be key to recovering the quality and quantity of artifacts necessary to understanding how habitation in, and use of, the area has changed over time. Large scale change in local geomorphology, especially as a result of changes in wetlands extent and location due to climatic fluctuations, can also affect which areas have high site potential for a given time period. Knowledge of these changes will allow researchers to look differentially in specific areas to target one or a few distinct cultural phases depending on the expected available landforms for the period of interest. Another reason the cultural phase representations may be skewed is due to development. Benton County is primarily agricultural land, and as such remains largely within the private sector. Compared to other counties, Benton County has had less archaeology conducted as a result of federal requirements or state regulations. These archaeological surveys have helped build the cultural chronology in other counties by requiring investigations in areas that would not have otherwise been targeted by researchers. As a result it is likely that the surveys conducted in Benton County have not been extensive enough or have not sampled enough landforms within the county to locate underrepresented cultural time periods. With the information gathered, especially in those areas not typically surveyed, we will begin to reconstruct the history of use and the differential spatial patterns of exploitation associated with specific soils, topographic features, and environments.

2. What are the densities and distributions of archaeological sites in northern Benton County?

The densities and distributions of sites are important for modeling and prediction. In the current study not only was site distribution tracked by landform and cultural period, but the amount of the surface that was covered by individual sites was used to demonstrate the percentage of utilized surface by landform (Table 35, Table 36, and Table 37). For example, five small lithic scatters on a given landform may utilize a smaller portion of the landscape than one large lithic scatter on another landform. The percentage of utilized landscape may provide a further refined perspective of how settlement occurred within the research universe.

Benton County is predominantly comprised of ground moraine and end moraine landform, and nine of the Survey Areas investigated in this project were found on this landform with Survey Areas 2 also partially located on floodplains and outwash terraces/plains. Survey Areas 4, 6, and 12 were found on floodplains and/or outwash terraces/plains.

Although very limited, the results from the 841.29 acres of the FY2015 HPF Grant survey shows a Late Archaic and a Late Woodland/Late Prehistoric presence in the northern portion of the county. No evidence of the Paleoindian presence was recovered in this survey. Ninety-six percent of the sites discovered in this survey were located on ground moraines and end moraines, which has soils associated with upland features. One survey area and four percent of the total sites were located partly on floodplains and outwash terraces/plains. The location of projectile points on high rises of forest soil could indicate a preference trend for higher, dry soils surrounded by wet prairie providing access to diverse resource sets, seasonally or on a permanent basis. This interpretation however should be the subject of future investigation. Whether this is representative or not is unknown as more than ninety percent of the surveyed area was on uplands (89% of the county vs. 92% of surveyed area), which was due to limited permission and visibility issues. This slightly disproportionate percentage of upland landform surveyed needs to be kept in mind when comparing results to previous HPF grant surveys conducted (e.g., Macleod and Donovan 2014; Swihart and Nolan 2013, 2014). A larger area of lowland landforms is needed to determine the true nature, extent, and intensity of use of these landforms. However, it is clear that lowlands were low intensity use spaces. Aside from the Late Archaic period (12-Bn-165), the Middle Woodland (12-Bn-152), and potentially the Early Archaic (12-Bn-164) time periods, the settlement patterns for different prehistoric cultural contexts are difficult to analyze due to the lack of recovered diagnostic materials during our surveys in the northern portion of the county. In total, 95.29 percent (n=81) of sites and 96.56 percent (n=505) of recovered artifacts located on ground and end moraines, with floodplains having the lowest encounter rates (Table 36; Table 37). The fact that survey was limited to a majority of upland landforms means that the sample of the archaeological record in Benton County obtained during our efforts is mostly representative of one type of taphonomic, geomorphic, and pedogenic process, that is, the ground moraine and end moraine setting.

Table 35: Projectile Point Site Numbers and Cultural Periods Per Landform.

Landform	Sites and Cultural Periods
Ground moraines and end moraines	12-Bn-152 (Middle to Late Woodland) 12-Bn-164 (Early Archaic) 12-Bn-165 (Late Archaic)

Table 36: Site Densities and Distributions By Landform.

Landform	# of acres	# of sites	Density	Distribution
Ground moraines and end moraines	777.14	81	1 site per 9.59 acres	Sites cover 10.42% of surface area
Flood plains and outwash terraces/plains	64.15	4	1 site per 16.04	Sites cover 6.24% of surface area

Table 37: Number of Artifacts per Landform.

Landform	# of artifacts	% of artifacts recovered
Ground moraines and end moraines	505	96.56%
Flood plains and outwash terraces/plains	18	3.44%

The majority of sites were discovered on silty clay loam and silt loam texture soils. A total of 64.71 percent of sites are located on silt loams (n=55), 28.24 percent of sites are located on silty clay loams (n=24), 4.71 percent of sites are located on loam (n=4), 1.18 percent of sites are on clay loam (n=1), and 1.18 percent of sites were located on muck (n=1).

Poorly drained soils (n=51) were the predominant drainage class with 60.00 percent of the sites occurring on these types of soils. A total of 4.71 percent of sites were found on moderately well drained soils (n=4), 8.24 percent of sites were found on somewhat poorly drained soils (n=7), 27.06 percent of the sites occurring on very poorly drained soils (n=23), and no sites were found on well drained soils.

3. What is the settlement pattern for Euro-American people in northern Benton County?

The historic cultural context was present in Survey Areas 1-11 and was representative of the initial mid-19th century settlement of the county thru modern times. Mean dates were taken for each survey area by using artifacts that displayed a date range (Table 38). This excluded non-diagnostics and anything with unanchored parameters (i.e. pre-1940). Results indicate that the majority of survey areas were most likely active during the late 19th and early 20th centuries. This is corroborated by the mean historic date of the whole survey which was 1905. Both of these pieces of information are in keeping with the literature narrative. The European settler population stayed very low until 1840 with the official establishment of Benton County and only then did the population increase. Population increased in 1871 with the establishment of the railroad along the old Indian trails and in 1882, the Indiana and Chicago Railroad laid tracks through Oxford, creating a way for farmers to have easy shipping (Taylor 2009:12-13).

The railroads made westward expansion easier and connected the groves of Benton County, which were inhabitable groups of trees.

Table 38 Survey Area Mean Dates for Historic Artifacts.

Survey Area	Mean Date
Survey Area 1	1906
Survey Area 2	1887
Survey Area 3	1900
Survey Area 4	1911
Survey Area 5	1905
Survey Area 6	1920
Survey Area 7	1895
Survey Area 8	1917
Survey Area 9	1900
Survey Area 10	1905
Survey Area 11	1917
Survey Area 12	N/A
All Survey	**1905**

4. What is the average site density within the county?

Before this survey there were 96 documented sites in the county (Volume 2, Appendix A). Upon completion of the survey, 85 sites were added to the site database making the total 181 sites in Benton County. For this survey, the average site density was one site every 9.89 acres with survey area densities ranging from one site per 195.97 acres (SA8) to one site per 3.36 acres (SA10) with one negative survey encountered (SA12). Although previous indications of density vary, prior surveys have indicated a positive ratio survey of one positive survey per 6.33 surveys conducted. If we evaluate our survey areas as individual surveys, our ratio of successful surveys for this study is one positive survey per 1.09 surveys conducted. The low ratio of successful surveys for this study could be due to the large amount of land and high visibility. Conversely the higher ratio shown by the previous surveys may be influenced by low survey acreage (total and per survey), different methodologies, or poor field conditions.

5. Is prehistoric occupation more extensive and/or more intensive at the ecotones between the environmental zones?

Of the twelve surveyed areas, four survey areas had a prehistoric component with more than three prehistoric artifacts. Survey Areas 1, 2, 5, and 9 yielded 91.36 percent (n=74) of prehistoric artifacts recovered from Benton County (Table 39). More than sixty percent of Benton County is comprised of Argiudolls and Endoaquolls, which are poorly drained prairie soils (Figure 114). Interspersed are Endoaqualfs, and Hapludalfs occasionally on subtle rises.

There are a few locations where a combination of three or more soil great groups creates an ecotone, or unique micro-ecology, on the landscape and specific environmental settings offer a diversity of resources that can be exploited. A fine grain analysis of the soil great groups reveals that Survey Areas 5 and 9 were situated on the ecotones of prairie (udic and aquic mollisols) and forest soils (Hapludalfs). Between the two survey area, 34 sites (40%) and a total of 265 prehistoric artifacts were recovered from these ecotones, suggesting prehistoric exploitation of that specific soils group, and specific kinds of ecotones.

Survey Area 5, located close to the eastern boundary of the county, had 13.58 percent (n=11) of the recovered prehistoric artifacts and contained no diagnostic lithic artifacts. Two of the sites were prehistoric isolated finds and two sites were lithic scatters. Survey Area 5 is a 67.05 acre parcel with Argiudoll, Endoaquoll, Humaquepts, and Hapludalf soils present. The combination of forest soils on rises surrounded by dry and wet prairie soils creates a unique micro-ecology not represented in the other ten survey areas. Combined with the presence and number of prehistoric artifacts and the orientation of prehistoric sites on the edges of dry prairie and forest soils, it appears these ecotone were selected for their unique environmental setting and resource diversity.

Survey Areas 9, also located almost to the eastern boundary of Benton County and deep in the wetland environmental zone, contain 77.78 percent (n=63) of the prehistoric artifacts recovered from the FY2015 survey. Survey Area 9, which has 61.18 percent (n=52) of the recovered prehistoric artifacts from Benton County, has three diagnostic projectile points recovered, with the earliest dating to the Late Archaic time period. Ten of the sites were prehistoric isolated finds, ten sites were lithic scatters, and two sites were multicomponent lithic and historic scatters. Survey Area 9 is a 105.85 acre parcel with Argiudoll, Endoaquoll, Endoaqualf, and Hapludalf soils present. The combination of dry forest soils on rises surrounded by wet prairie and forest, represents a unique ecotone not reflected in any other survey area. Combined with the presence and number of prehistoric artifacts and the orientation of prehistoric component sites on the rises of dry forest (Hapludalfs) soils suggests that the ecotone was favored for its unique environmental setting and resource diversity.

Both Survey areas 5 and 9 display a combination of three or more soil groups which create a micro-ecology with a rich diversity of resources, while the remaining ten other survey areas consistently had three or less soil groups displayed (Figure 114).

Based upon the archaeological artifacts recovered from the survey, there appears to be more intensive or extensive prehistoric occupation at the ecotones between the environmental zones.

Table 39: Survey Areas with Prehistoric and Historic Artifacts in Benton County.

Survey Area	Historic	Prehistoric
SA1	74	7
SA2	4	4
SA3	5	0
SA4	9	1
SA5	164	11
SA6	4	0
SA7	24	3
SA8	4	0
SA9	38	52
SA10	69	2
SA11	47	1
SA12	0	0
Total	442	81

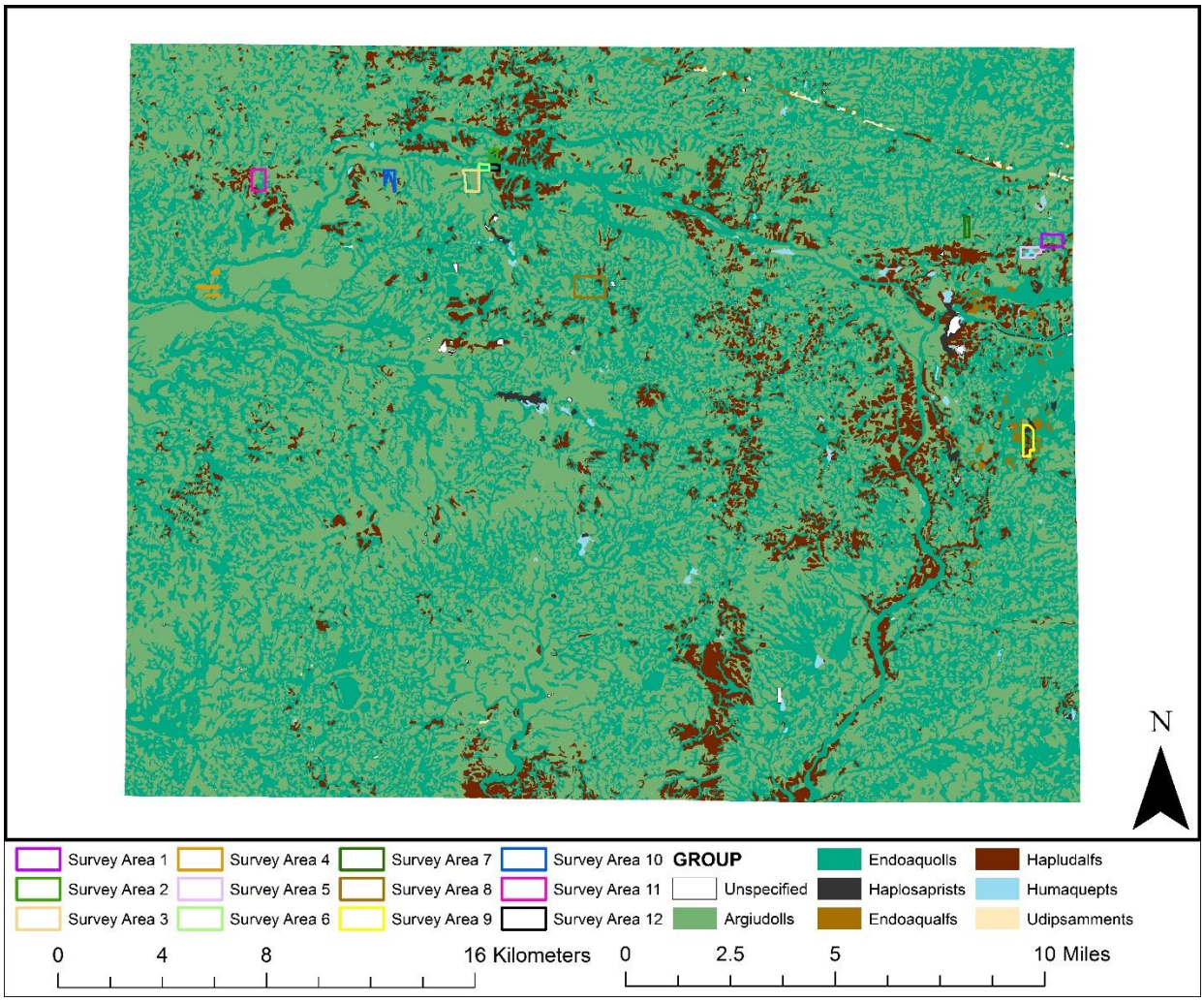

Figure 114: Survey Areas with Prehistoric Component on Soil Suborder Classifications (Soil Survey Staff 2013).

Conclusions and Recommendations

This project primarily targeted the northern half of Benton County, Indiana. The project area was selected due to the lack of known archaeological sites in the SHAARD database and the identification of Benton County as a data deficient county. The goals of the project were to increase the site database, construct a more complete cultural chronology for the county, understand and refine both the settlement patterns, as well as the patterns of interaction between and among early Euro-American settlers and Native Americans.

Benton County displayed a lack of artifacts, which is consistent with results of previous surveys conducted in and around Benton County (see references in Table 2). It is very likely that the county soils and available forest resources during prehistoric times and into the mid-1800s heavily influenced the habitability of the area. There are no major rivers running through Benton County and the county is drained by five main streams: Big Pine Creek, Mud Pine Creek, Sugar and Mud Creek, and Carpenter Creek. The county was originally predominately comprised of dry prairie and wetlands with pockets of forest (Figure 19, Figure 114). Prehistorically, wetlands would have been economically important, and potentially attracted people from atypical distances seasonally. The fluctuations of surface moisture seasonally and through the centuries would have exerted a great influence on prehistoric activity distributions. Wetland communities in Benton County have decreased due to increasing number of agricultural and wind farms (Taylor 2009:15). However, the variably extensive wetlands would have dramatically restricted both livable land and resources in the area for the incoming Euro-American settlers during the historic period. This constraint would have concentrated those individuals who were there to select upland and well drained features in order to avoid the marshlands that were so prevalent throughout the county. This feature would explain why relatively late Euro-American settlement focused more around the scattered groves, pushing the majority of the historic settlement dates to much later in the 19th century. Expansion did not take place until 1871 with the establishment of the railroad along the old Indian trails and in 1882, with the Indiana and Chicago Railroad (Taylor 2009:12-13). The railroads made westward expansion easier and connected the groves of Benton County, which were inhabitable groups of trees.

The diagnostic prehistoric artifacts recovered from the survey areas date to the Late Archaic and Terminal Middle Woodland/Late Woodland periods. Though the amount of recovered prehistoric diagnostics from the survey is not enough to make generalizations regarding occupation habits, we may be able to use this information in order to identify the use of the land during these periods. The points were found on rises consisting of Miami silt loam, a well-drained alfisol, surrounded by Chalmers silt clay loam and Houghton Muck both poorly drained soils. Since prehistoric habitation sites would have been located on higher, dry ground, the location of the points and the variety of chert used to make lithic artifacts could indicate that

those areas were used to manufacture lithic tools, either as part of a wider exploitation and activity strategy or as an isolated activity.

The majority of the precontact sites were unable to be identified by cultural period; however, three prehistoric cultural periods, the Early Archaic, the Late Archaic, and the Middle Woodland to Late Woodland, were documented. Three historic sites (12-Bn-107, 12-Bn-123, and 12-Bn-125) and three prehistoric sites (12-Bn-152, 12-Bn-162, and 12-Bn-165) were recommended for further investigation and 79 sites were recommended as not eligible for listing on the Indiana Register of Historic Sites and Structures or the National Register of Historic Places. An anomalously high density of historic artifacts in the northern area of Survey Area 4 and an anomalously high density of prehistoric lithic artifacts and projectile points in the western area of Survey Area 9 indicates that further research into these areas would be beneficial to a more complete understanding of the prehistoric and historic settlement of Benton County.

The surveys conducted in Benton County are unable to be compared to those of other Indiana counties whose results show a greater evidence of land use in upland areas due to the large sample of surveys of upland features in Benton County (Leeuwrik et al. 2015; Macleod et al. 2015; Swihart and Nolan 2014). Due to 92 percent of surveys and 88.5 percent of the county being located on upland landforms it is difficult to make a comparison to the occupation patterns as found on other varieties of landforms. Previous surveys have indicated a site preference for upland landforms, but this site trend could be biased due to lack of archaeological survey and disproportion ratio of uplands to lowlands across the county. For the future, survey of a greater variety of landforms would be beneficial in expanding the knowledge of occupation patterns across the county and making inferences about upland feature occupation preferences.

Many factors could have influenced the project data including the location of the surveyed properties, whether a field was tilled recently or not, the collection of fields by lithic enthusiasts and even local weather patterns prior to field survey. Further research into prehistoric landform usage is recommended within Benton County.

Benton County would benefit from further archaeological investigations, especially those focusing on the procurement of diagnostic prehistoric materials and systematization of landform use prehistorically. Included in this should be further large scale pedestrian surveys to complement the findings in this report as well as identify potentially new areas of interest. Particularly surveys that attempt to capture representative samples of the topographic, geomorphic, hydric, and texture properties of landforms and soils given the peculiar hydrological history of this area and the already documented peculiar distribution of archaeological materials in this portion of the state (Macleod et al. 2015; Surface-Evans 2015; and this report). Surveys designed in this way could add not only to our understanding of

shifting resource procurement and settlement strategies throughout prehistory, but could also be used to hypothesize changes in overall drainage properties of the region.

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